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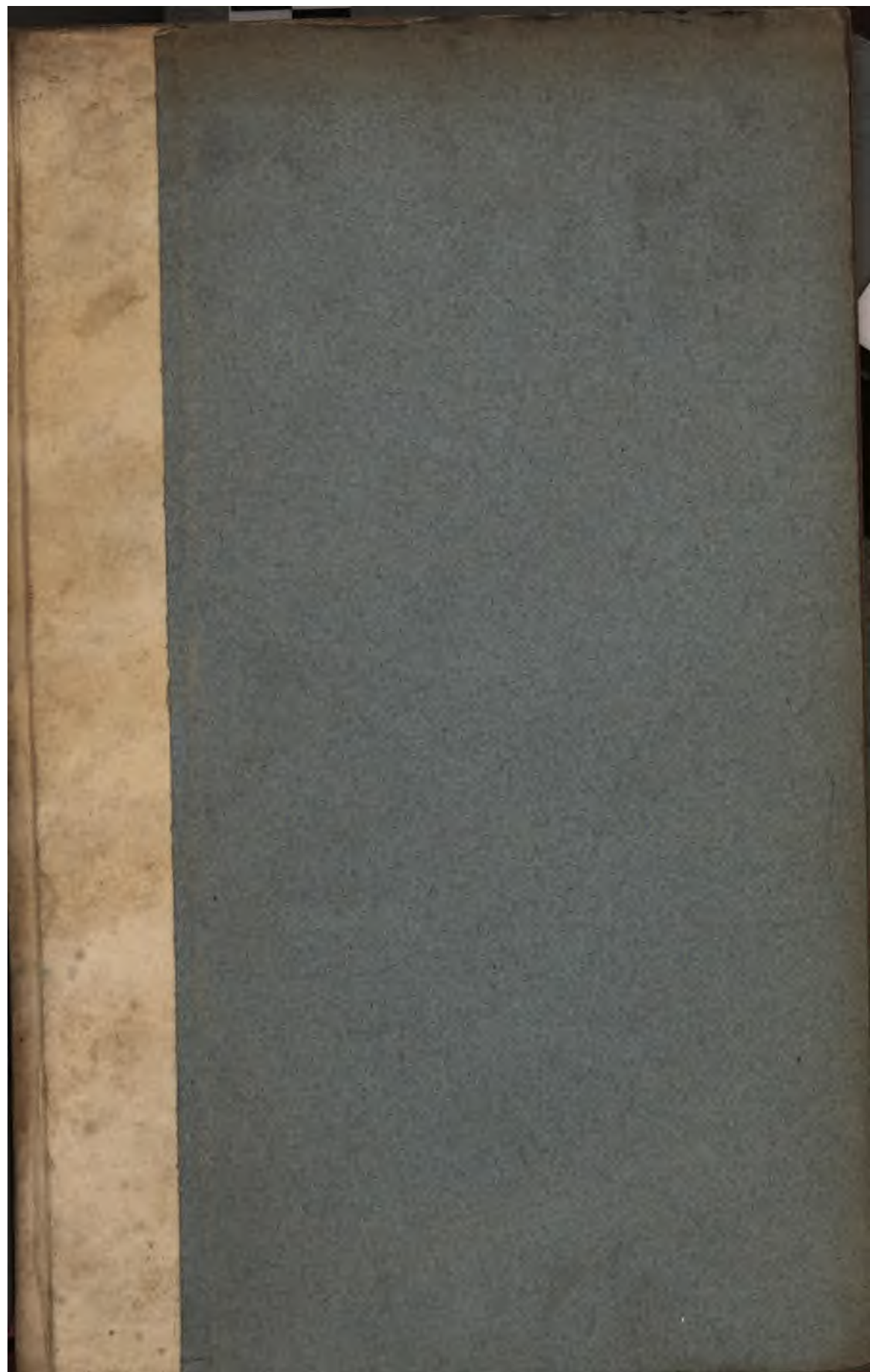
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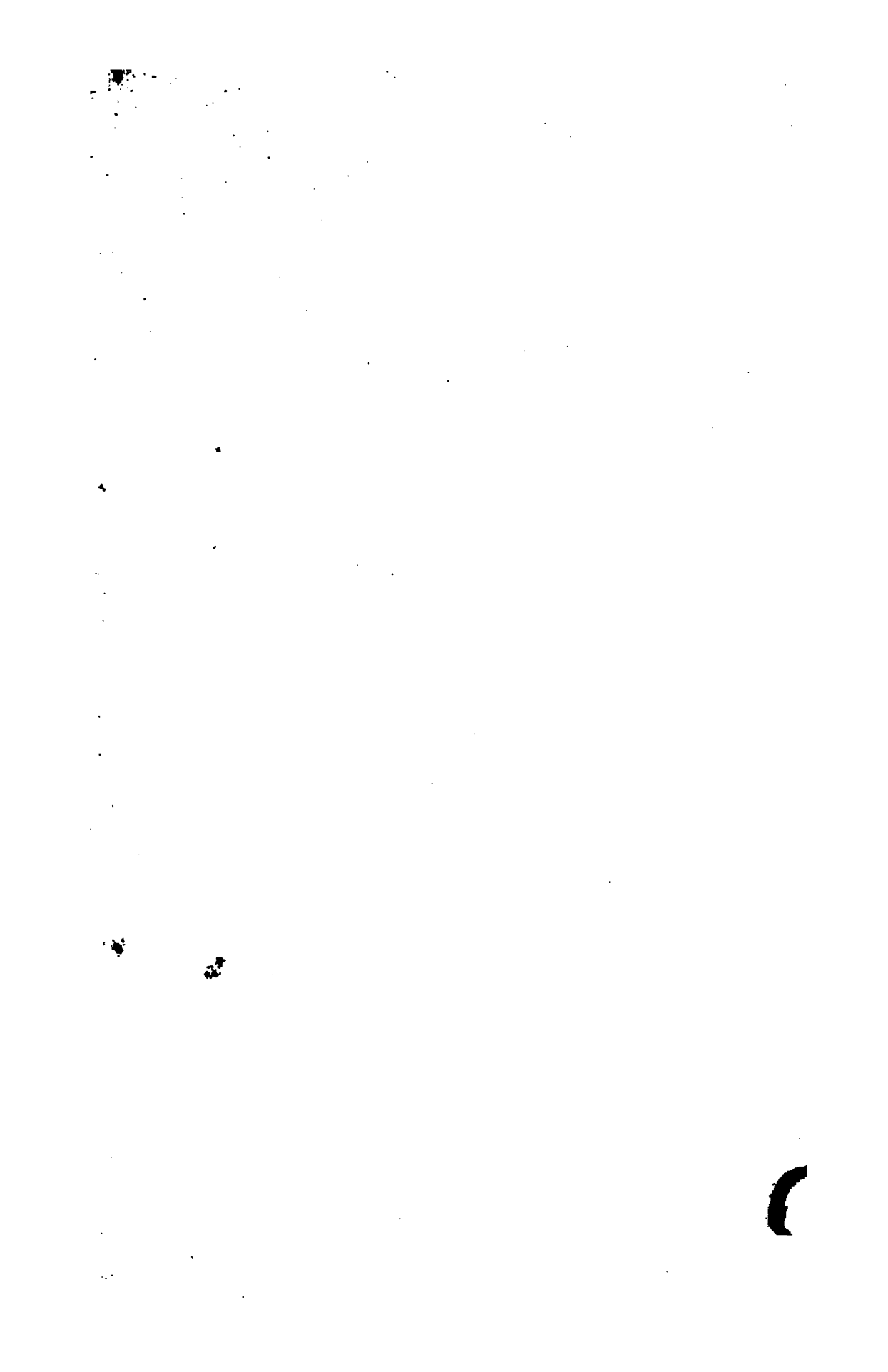
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HYDRO-INCUBATION,

ITS THEORY AND PRACTICE:

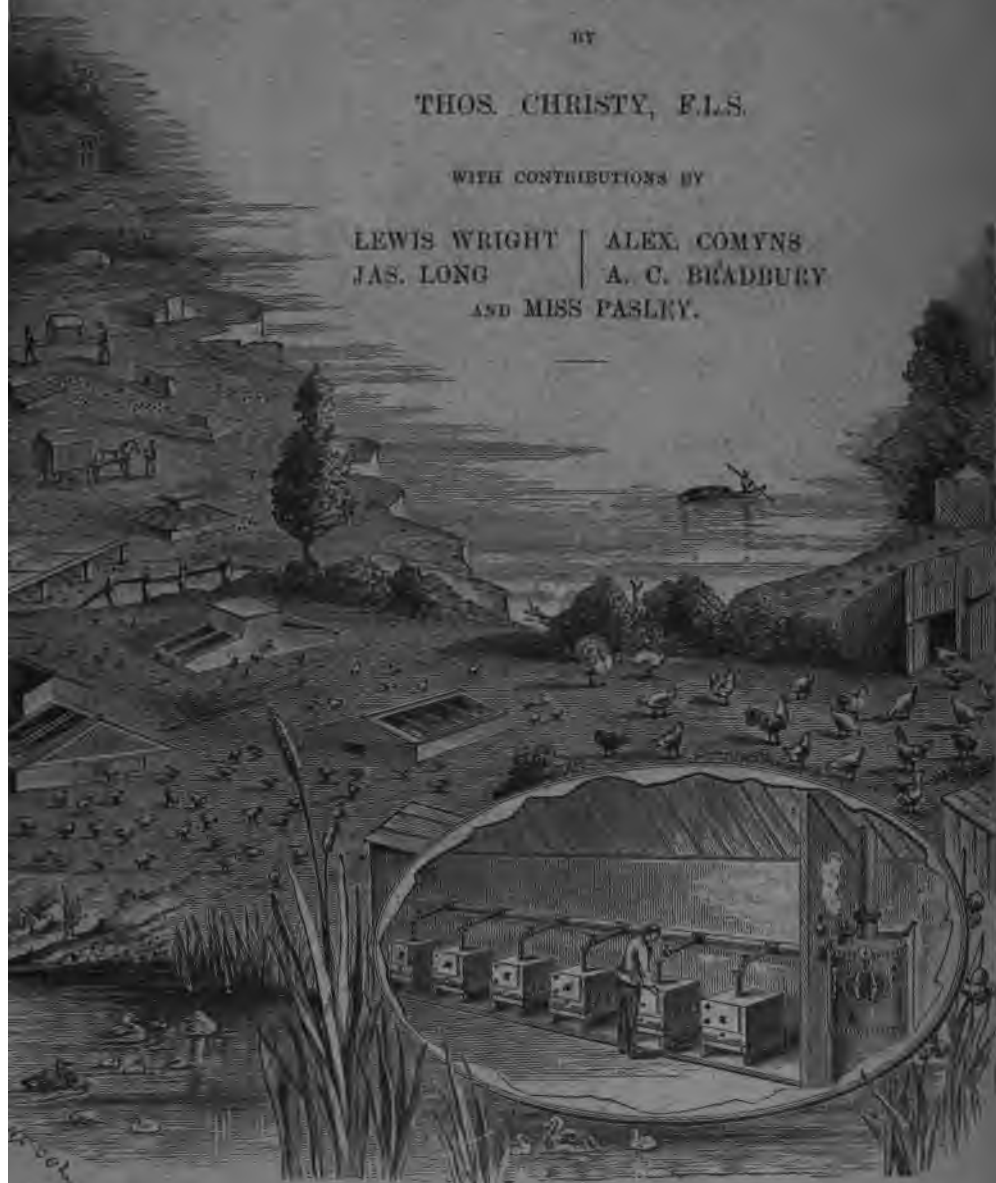
A GUIDE TO COMMERCIAL POULTRY FARMING.

BY

THOS. CHRISTY, F.R.S.

WITH CONTRIBUTIONS BY

LEWIS WRIGHT	|	ALEX. COMYNS
JAS. LONG	|	A. C. BRADBURY
AND MISS PASLEY.		



SEVENTH EDITION.

LONDON: CHRISTY & CO., 155, FENCHURCH STREET, E.C.

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Printed at (Antiquary Hall)

By J. W. Pugh & Co. Ltd.

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ENTERED AT STATIONERS' HALL.]

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P R E F A C E .

SINCE the issue of the Sixth Edition in 1880, an answer has been given by the people of the United Kingdom that they intend to advance in the matter of Poultry breeding on a commercial scale, and it is quite an exception to find anyone thinking that poultry cannot be raised with advantage by artificial means. More Hydro-Incubators have been sold in Europe this year than last, and my statements have been more than verified, as I prove in this issue.

Ostrich farming could not be carried on commercially if it were not for the assistance of Incubators, I have therefore paid great attention to the improvement of these machines, especially to decrease the quantity of water that has to be moved, and to adapt the construction to the necessities of different climates.

After all what does it amount to? Have we done more than copy the Chinese, or have we even done as much in this one art or business?

As a few men, headed by Canon BAGOT, have led the Irish Dairy Farmers to feel that they can secure rich markets for their produce by following rules of care and cleanliness with butter, so that they occasionally surpass even the finest Normandy, I maintain that I have as strong an array of friends who prove by their results that Poultry can be successfully hatched and reared artificially to make it worth the while of Farmers to turn their attention to Poultry as one branch of their industry.

Hydro-Incubators are now being worked in many places on a large scale, by one boiler in an outside room, feeding through a pipe the different machines. A large number of birds are as easily attended to as smaller quantities.

Caponing has been made such a study that some workers record the death of one bird from the operation, so unusual is it to lose any. Even

the latest improvement of Mr. LISTER, consisting in the use of Carbolic Oil or spray, is utilised to quicken the healing of the incision made by the knife.

Chapters in this edition have been contributed by independent workers and breeders, for people must know those on whom they have to rely for information.

Workers with a *single* Hydro-Incubator have been assisted by the use of outside circulating boilers, served with gas or oil once every twelve hours. This is a great advantage when the water contains lime, for it avoids the necessity of putting fresh water into the iron cisterns.

Another class have been long waiting to try their hands, saying, give us an Incubator at a low price, smaller than your 90-egg machine, so that we can hatch a few birds early. This I have at last accomplished to my own satisfaction, and that of several who have worked it. This machine will lead its workers on step by step to get larger appliances.

The great question of preparing Fowls for market has not made much progress. T. BISHOP says: "For the London market the keel of the breast-bone must be broken but not the ribs." Those who have to carve the fowl say, let us have it French fashion, no breast-bone broken. By pressing the bird when dead, there is no doubt that the gas is forced out of the body, and this makes it keep better.

The nature of the meat on the fowls that are intended for food must be studied to decide if the quality is much affected by the feeding, and which fowls should be bred for table, and which are the best adapted for egg production, especially in autumn and winter. Again, there are more data wanted as to the best crosses of fowls to produce high-class food.

I have allotted some space to medicine for poultry and stock, for this is a point worth looking into.

THOS. CHRISTY.

MALVERN HOUSE, SYDENHAM,

November 12th, 1881.

HYDRO - INCUBATION.

PART I.—ITS THEORY.

NOTHING succeeds like success, and three public trials against all the different sorts of Incubators in Europe, the last of them culminating in the magnificent result of 69 chickens hatched out of 71 eggs, have placed both the theory and the practice of Hydro-Incubation beyond all doubt. In commencing the Seventh Edition, I feel, therefore, that the best argument as to the suitability and adaptability of the system depends upon the verbatim accounts of the working of a few, out of more than 1,500 persons in Great Britain alone, who now prefer artificial means for hatching and rearing their poultry and game. These accounts will be found further on in this book, as well as the *certified results* of the hatching by "Christy's Hydro-Incubators" at the Hemel Hempstead trials,* and at the Ayr, Sudbury (Suffolk), Kendal, Elgin, and Cambridge Ornithological and Poultry Shows.

Within the four years that have elapsed since the publication of the first edition of this book, a marked change has come over the views entertained of poultry by very many persons in England. Instead of regarding a yard devoted to poultry, turkeys, &c., with perfect indifference, or even with absolute dislike, many farmers are now actively busying themselves in reforming this neglected part of

* To prevent all cavilling at the two Hemel Hempstead trials by contending exhibitors, I sent Hydro-Incubators for trial, and now give results obtained at four different shows. In every case a stranger has worked the apparatus, and in each instance the Show Committee has certified to the correctness of the report. At Sudbury (Suffolk) there were hatched 61 chicks from 66 good eggs, at the Kendal Show 22 chicks from 24 good eggs, at Elgin 36 chicks from 50 eggs, and at Cambs. Ornithological Society's Show, 37 chicks from 43 good eggs. These are results obtained from eggs laid in November and December, 1879 — an exceptionally hard and unfavourable season. I hope non-believers in the Hemel Hempstead trials, will diligently take note of these four further public expositions of hatching by Hydro-Incubators of my design.

their establishments. Ideas are now frequently heard of treating poultry as regular stock on a farm, of fattening it, of even selling it by weight, and above all, of providing the country generally with a supply of eggs, and birds in the early spring. At the time of my writing this, the report of an Essex farmer's success in breeding, fattening, and selling poultry in the open market has lately been published in *The Live Stock Journal* and Eastern Counties newspapers; and to my personal knowledge operations on a very large scale are being undertaken in several different parts of the country. A nobleman in Worcestershire means to show his tenants that the thing is feasible, and has gone to work in the right way by engaging a practical man, who understands every detail of the business, from the "Hydro-Incubator" to the fattening, dressing, and selling. One gentleman, whose enterprise and experience ought to command success, has obtained a large tract of sandy land, at a nominal rent, from one of our great landed proprietors, who is as desirous as his tenant for a successful issue of the experiment. He knows it means doubling his income by utilising acres and acres of sand, at present productive only of a few rabbits. At Formby, near Liverpool, on one establishment, they keep 17 "Hydro-Incubators" pretty generally at work.

Thus artificial incubation and rearing may be said to be already well introduced into this country, and it will be but a short time before poultry is fed, fattened, and prepared for table in England in a manner that hitherto we have unwisely left to our French neighbours to do for us. It has proved a profitable source of industry to thousands of them, and will, in its turn, be to us, as soon as we get rid of that well-worn old phrase:—"Poultry don't pay!" Would breeding horses, cattle, pigs, and other stock have "paid," if the animals had never been properly housed, or tended, or regularly fed?

The hen is a necessity, as the *producer* of eggs, but she cannot hold her own against the inventions of man, when it comes to either the hatching of her own or other eggs, or even the rearing of the young birds. Again, the letters and reports of public trials, printed further on in this book, are the best possible proofs of the fact. For successful poultry farming, a means of hatching earlier in the season, and at a time desired by the owner of the poultry, is a necessity, and to wait for the broody hen is, commercially speaking,

impossible. The crushing and breaking of the eggs, and trampling of chicks, and the trouble of sitting hens, is a serious loss to the poultry farmer. To keep the young chicks free from vermin and insects (a complete impossibility under hens) is also an enormous gain. In short, if poultry is wanted early, in large or small quantities, strong and healthy, something must replace the broody hen, or the poultry question of this country will still be solved financially in favour of France and Italy.

From the earliest times, we find efforts were made in this direction. Probably the first attempts at artificial hatching took place in India or China, where, to this day, decayed organic matter is used for hatching out ducks' eggs. Pliny refers to the Egyptians hatching their eggs in large vases. In Egypt, later on, and up to this day, an enormous quantity of eggs are continually being hatched in underground ovens. But in this book it is useless to go over the various forms and modifications through which Incubators have had to pass, before being brought to their present state of comparative simplicity and perfection. It may, however, be of interest to trace out briefly the origin of the "HYDRO-INCUBATOR," the "*raison d'être*" of this volume.

In 1855, the first so-called "Hydro-Incubateur" was exhibited by Mr. Gérard, in France, who, in his circular, claimed, if not the full merit of invention, at least to have simplified and cheapened the means of artificial hatching. His system was to provide the necessary heat by means of a hot-water cistern of indiarubber, placed in contact with the top of the eggs. Mr. Gérard maintained the heat of the water by burning a charcoal fire let into the cistern in a cylinder. He was, probably, also the first to produce a portable artificial "rearing mother." Expense and trouble in working, however, eventually caused Mr. Gérard to give up his idea. Another hot-water incubator was that of Cantelo, which was exhibited in England, and marked a greater advance than any before it.

Since Cantelo's machines were exhibited in 1851, very many attempts have been made by Boyle and Penman, of English fame, and Roullier and Voiteulier, in France, culminating in the International trials at Hemel Hempstead in 1878, and again in October, 1879, when the "Christy Hydro-Incubator" distanced all competitors by hatching out 69 birds from 71 eggs. The drawbacks of defective ventilation and moisture in the earlier of these Incubators need not

be described, but a word of warning as to the means taken to heat incubators may not here be out of place.

A gas jet is always uncertain, owing to the unequal pressure at the main, caused by the greater or lesser amount of gas being drawn at a time by the different consumers, and there is also the risk of the flame being extinguished altogether by a draught, or even by a sudden shock. The difficulty of regulating the temperature is also considerable in gas or continuous lamp-incubators, necessitating the use of costly and intricate regulators, and requiring more skilled attention than is to be expected from ordinary poultry attendants. Every complication in the way of regulators adds a risk of the machine breaking down, besides rendering the working more difficult to grasp. Another great disadvantage to either continuous gas or lamp flames is, that the nature of both tends to vitiate and dry the air, and an absolute necessity for successful incubation is to obtain a supply of pure air, especially after the tenth day. On no account should the gas or lamp be always burning, but for the short time, night or morning, necessary to re-heat the water in the cistern, the bad effect can be easily counteracted by opening the window of the room during such time.

Accidents to gas and lamps are frequent, and notwithstanding the elaborate contrivances for allowing a certain sized flame to produce a regular heat, the smallest mistake of the attendant, or anything but absolute accuracy, and the most constant supervision to the various elaborate mechanisms, produce the same disheartening result of either lowering the temperature till the eggs become too cold, or of raising it to such an extent that they are positively cooked, and of course, in either case the chick, or embryo chicken is killed. The change of temperature in England in 12 hours was found to necessitate a change of lamps from four wicks to two wicks, as the regulators could not compete with the changeable weather. In the "Hydro-Incubator" it was resolved to substitute some other heat-producer to either oil-lamps or gas, and hot water was introduced as being exactly suited for the purpose. Everyone knows that hot water, excluded from contact with the outer air, retains for a long while its normal temperature, losing its heat very gradually by radiation. The LARGER THE BODY of water so shut in, and the denser the packing of non-conducting material round it, the better is the heat retained.

This truth understood, artificial hatching then resolved itself into a question of determining upon the best form the future apparatus should assume, and very properly, nature was copied as nearly as possible.

In the "Hydro-Incubator" is a large cistern of hot water directly over the whole extent of the drawer or drawers containing the eggs. Thus every part of each drawer is equally heated; not one corner or part five or six degrees hotter than another part, which is frequently the case in Incubators with continuous burning lamps, and without the safeguard of a large body of water, the best of all regulators, as it renders a sudden rise or fall of temperature impossible. Ventilation too, is made a great point of. It is not sufficient to open a drawer and give the eggs air for a few minutes only; they require more ventilation. The "Hydro-Incubator" is furnished with tubes in the sides, allowing cool air to enter above and below the eggs. This fresh incoming air being cool and damp, condenses and produces a moisture which is most beneficial. Large "earth trays" filled with wet earth or wet sand, are kept below the eggs, and the evaporation from these trays is of great importance. It serves the purpose of keeping the air in the egg drawer moist, and without it, the skin inside the egg shell becomes so hard that many chicks die on the 19th or 20th day from sheer inability to break through this membrane. The detailed instructions for working a "Hydro-Incubator" will be found in another part of this pamphlet, and they show what an advantage a system of such simplicity possesses. The cistern is filled with hot water when the machine is first used. A portion of the water is then drawn off every twelve hours, and is replaced by an equal quantity of boiling water, or more generally, the water in the upper cistern is re-heated by means of an outside circulating boiler, fixed to either the side or back of the machine, and which attachment saves all the trouble of drawing off and refilling with boiling water, besides enabling the machine to be worked in a much colder temperature, and the heat to be regulated more accurately. The cistern is so arranged that only the top stratum of water is affected, and even though some of the water be drawn off and replaced boiling, it could not at once descend to the bottom compartment of the cistern, as would be the case with a merely plain tank, and which would have the effect of suddenly raising the temperature above the eggs, and probably of

spoiling them. In the same way, and for the same reason the Circulating Boiler is so arranged, that it only heats the upper half of the water in the cistern.

The water in the compartment nearest the eggs, in fact, hardly varies its heat from the time the "Hydro-Incubator" is set going, until the cistern is entirely emptied. It is this arrangement which ensures the beautiful regularity of heat with which the improved "Hydro-Incubators" work.* A "low-range" thermometer is kept in the drawer, which can be pulled out at will, so as to ascertain the precise temperature at any time of the day, without in the least interfering with the action of the Incubator.

"Hydro-Incubators" are made in different sizes, the usual pattern holding as many as 90 eggs, although of course it is as easily worked with any smaller number. Ostrich machines are sometimes very large.

A new pattern "Hydro-Incubator," first built to the order of the Hon. Secretary, of the Poultry Club, and christened by him "The Fancier," is an important novelty introduced during the past year, and is, I consider, the most perfect in principle and action of any small-sized Incubator. I say this because of the two advantages it gives the special class of Poultry breeders, whose wants it has been designed to meet. The eggs, as few as desired, can be added each day without any danger of chilling those already in the drawer, and all the eggs, by an arrangement of double egg drawers, are kept for the first ten days of incubation in an unventilated chamber, where the air is close and moist. From the tenth day they are supplied with an abundance of air. Rising and falling floors are fitted to each egg drawer in the "Fancier," rendering it more easy to keep the same temperature in both, and enabling the worker to allow more space to chicks just hatching, than is customary in other Incubators. Mr. Comyns description of "The Fancier" will be found on another page. I have just said that the "Fancier" Hydro Incubator is an important novelty of the year, but the latest pattern of all is an Incubator for three dozen eggs, a small portable machine, worked by the change of a gallon of water at regular times. Considering its size, this is wonderfully successful. It must of course be placed in a warm situation, as the body of water is not very great, and it

* See "Register of Public Trials," further on.

could not compete, as regards retaining its heat, with either the "Fancier," or the larger forms of "Hydro Incubators."

In all the Rearing Mothers, and in the drying box, the same principles are followed as with the "Hydro-Incubator." Each cistern is lined underneath with a piece of flannel, against which the chicks press with their backs for the sake of the warmth, and which serves to prevent the metal cistern from burning them, and as a warm air-chamber above them. The advantage of the equal distribution of heat is here even more perceptible than in the "Hydro-Incubator." With many artificial mothers, complaints have been made that the chicks crowded into the corners, and the stronger birds killed the weak ones. The reason of this is, that all the chickens strive to get where it is warmest, and in many of the older patterns of artificial mothers, portions were left comparatively cold.

Breeders find not only that they lose fewer birds by far, rearing them in the Hydro-Mothers than if left to hens to bring up, but that artificially-reared chicks grow faster and make finer birds than when reared by hens. The difference is, that, under these appliances there exists greater cleanliness and freedom from vermin.

This advantage of artificial rearing is not mere fancy, nor is it based upon one simple experience. It is within the knowledge of many hundreds of people, and some of our most noted fanciers take full advantage of it, and reap their reward in an increased number of prizes at the early shows. The difference in the size of two lots of birds, the one reared under hens, the other under the hot water mothers, at a few weeks old is simply incredible to any one who has never reared chickens except under hens, and this quick growth during the first three or four weeks after hatching means gaining an advantage which no care or attention later on will enable other chickens, not so well started, to pick up.

The working power of both the Hydro-Incubators and Hydro-Rearers has been shown to be boiling water solely, but the power can be applied in two ways :—

- 1st.—By partially recharging the cistern with boiling water each night and morning (Old System).
- 2nd.—By means of an Outside Circulating Boiler, heated by Gas or Oil, or from the kitchen-range, obviating all change of water (New System).

Before proceeding to give the detailed instructions for working, I must say a word or two about the position to choose for the "Hydro-Incubator."

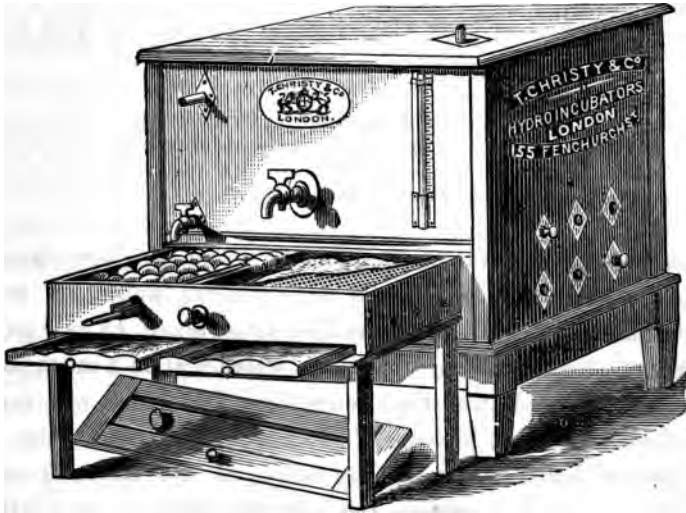
In deciding this, bear in mind the three great elements of success; they are—1. Fresh air and perfect ventilation; 2. Sufficient moisture in the air; 3. The maintenance of the proper temperature in the egg drawer. I place these three cardinal points in a rather different order to what many people would, but I do so from the experience gained not only by my own trials and experiments, but from the working of "Hydro-Incubators" in the hands of many hundred poultry breeders.

A close cellar with cold moist temperature offends against point 1, for where the atmosphere would militate against your own healthy existence, it cannot be good for the embryo chicks. On the other hand an underground room, or cellar, provided with a good system of ventilation, and which feels airy and fresh, although damp, would make an excellent hatching chamber. Never mind how damp it is! If the walls are running with moisture so much the better, provided the fresh air be supplied abundantly and regularly.

In many cases, however, "Hydro-Incubators" have to be worked in ordinary rooms on boarded floors. Here you can always ventilate, but feel the lack of moisture in the air. It is now therefore necessary to pay every attention to the earth trays, or evaporating pans, and I should strongly recommend using four small extra evaporating tins, one in each corner of the drawer itself, on the top of the flannel, whenever the "Hydro-Incubator" is worked on a boarded floor.

I have purposely said nothing about point 3, because, provided the temperature of the room is fairly even, and not excessive, that is all that is required. A greenhouse which, with the sun on it, attains a temperature exceeding 100° will not do for obvious reasons. Keep the three points given above well before you when settling upon the place where you intend placing the "Hydro-Incubator," and you will be able to decide which of the positions available is the one most suited to a successful use of it.

PART II.—ITS PRACTICE.



HYDRO-INCUBATOR FOR 90 EGGS ON STAND WITH DRAWER SUPPORT.

WORKED IN TWO WAYS:

- 1st.—By partially recharging the cistern with boiling water each night and morning. (Old System.)
- 2nd.—By means of an Outside Circulating Boiler, heated by gas or oil, or from the kitchen range, obviating all change of water. (New System.)

INSTRUCTIONS.

The question of position decided, proceed to place the Hydro-Incubator on its stand at about one foot from the ground, and not touching anything so as to hinder the circulation of the air all round it, and you are ready to commence the working.*

The whole theory of artificial incubation is, as has been shewn in the preceding chapters, to keep the upper part of the eggs at a regular temperature of, say, 100 to 106 degrees Fahrenheit, and to provide sufficient moisture and ventilation.

The following rules of working are based upon a 90-egg Hydro-Incubator, the same make as the one which secured the verdict at the Hemel Hempstead trials, and I proceed first to give the

* There must be at least a space of one foot left clear on both *sides* of the machine, but there is no objection to the back of it being placed close up against a wall.

RULES OF WORKING

BY THE "Old System" OF CHANGING A PORTION OF THE WATER
EVERY TWELVE HOURS.

(Although it is the exception now for Hydro-Incubators to be made to work on this old system, the Circulating Boiler described on page 22 being such an immense saving of trouble, and the extra primary cost is soon repaid by the convenience, and by the low cost of working them.)

Remove the low-range thermometer from the egg drawer.* Proceed to fill the cistern at E with boiling water. A 90-egg "Hydro-Incubator" will take, the first time, about 15 gallons, and the effect of such a quantity of boiling water will be a much higher temperature in the drawer than is required, but which will rapidly fall as the side and top packing of the Incubator absorbs the heat. After twelve hours, draw off the whole of the water from the cistern by the pipe A, canting the machine forward until all the water has run out. This is important, as a "Hydro-Incubator," like all other machines, must be properly started to work well. If not EMPTIED, the consequence will be that the machine will always require more water than if it had been properly made ready. All "Hydro-Incubators" (of the Gold Medal pattern) are tested to this point before being sent out to any purchaser; and after the second filling they will, at the expiration of four to five hours, register a heat in the egg-drawer of from 120° to 130° at the least. When this heat is attained, the machine may be said to have been properly started, and can be worked at a very low expenditure of boiling water every night and morning. When twelve hours have elapsed after filling the cistern the second time with 15 gallons of boiling water, place the low-range thermometer (marked from 90° to 110°) in its slide. As soon as the temperature falls to 108° or 106° the eggs may be put in, two or three gallons of the water being drawn off and replaced by boiling water, at the same time. From this point continue working, by drawing off such a proportion of the contents of the cistern every twelve hours, and replenishing with as much boiling water as may be found requisite, according to the season, position, and size of the Hydro-Incubator, so as to keep the

* You can of course place any thermometer in the drawer, provided it ranges up to 140° or 150°.

temperature in the egg drawer from 103° to 106°, as indicated by the thermometer. It is impossible to exactly fix the quantity of water required every twelve hours, for the temperature and conditions of atmosphere in the room, hot-house or building used, and the circumstances of winter or summer cause variations. As a rule, two to two-and-a-half gallons; night and morning, are sufficient with a 90-egg Hydro-Incubator (the Gold Medal pattern) in a working room where the temperature keeps at about 60°, and where the air is quiescent, but this rule *must* vary on account of draughts of air, &c., and is very greatly dependent upon how the machine has been started; one or two days' practice is sufficient to determine the quantity necessary. After the tenth or twelfth day, less water at each time will be required, as the embryos are then alive, and are of themselves a source of heat sufficient to make a difference of one-half reduction in the water supply for a full setting of eggs, and therefore, caution should be exercised between the twelfth and fifteenth days, or a sudden rise may occur in the temperature of the drawer. Of course, when working with but a few eggs, or putting them into the drawer each day, this difference is not nearly so perceptible.

The eggs should be quite fresh-laid to insure a perfect result, and may be placed in the "Hydro-Incubator" a drawer full at a time, or if preferred, a few each day as they are laid. If this latter plan is adopted the eggs added must always be thoroughly warmed through before a fire, as placing a stone-cold egg next one arrived, say, at its twelfth or fifteenth day of incubation, would be very prejudicial to the latter. A special incubator, "*The Fancier*," has been designed, and is built to meet this want. "*The Fancier*" is fully described on pp. 26-30.

Travelled eggs should be allowed 24 hours rest before being placed in the drawer, and all eggs should be dipped in water at 100° and wiped carefully immediately before they go into the Incubator.

On opening the drawer, night and morning, note should be taken of the temperature registered by the thermometer, so as to regulate the quantity of water to be put into the cistern. This must be done instantaneously, as immediately the drawer is exposed to the outer air, the thermometer falls several degrees in a few seconds.

The fact of placing 90 cold eggs in the drawer lowers the temperature several degrees, therefore always have the heat well

up to 106° or even 108° before you start. The eggs (which should each bear the date on which they were laid, as a mark on one side assists greatly in the operation of turning them), must be attended to at regular hours, twice each day of 24 hours, at the same time that the supply of boiling water is put in. In the morning they should be turned or moved, and they must be left out to cool twenty minutes, and even longer in hot weather, or hot rooms. In the evening turn the eggs and cool them as in the morning, before putting back the drawer. The cooling of the eggs is very important indeed, and you are much more likely to give too little than too much time to cool. The rough rule is—fifteen minutes night and morning for the first ten days, then increase the time by five or ten minutes, according to the weather.

Before starting, see that the side ventilators are quite clear, and when putting back the egg drawer night and morning, push it right back as far as it will go, or the air-holes, *I I*, in the sides of the drawer will not correspond with those in the sides of the "Hydro-Incubator."

If the "Hydro-Incubator" is started with a drawer full of eggs, all the outside air-holes should be closed for the first nine days. This plan greatly lessens the amount of water required, and favors incubation by producing a steamy atmosphere. Of course, after nine days the air-holes *must* be freed, as the living embryos require fresh air after that. This plan is only available when all the eggs are put in the drawer on one date, or when working with two or more Incubators, or with the "Fancier Hydro-Incubator."

Quite equal in importance to this point of ventilation is the necessity for moisture, of which it is almost impossible to have too much. Damping the eggs is a bad system, except in extreme cases, when it may be resorted to on the last few days. Keep the "earth-trays" fitted to each "Hydro-Incubator," working as follows, and a moisture at once natural and healthy will be produced in the egg drawer. Fill the "earth-trays" which slide under the perforated zinc bottom of the drawer with earth that has been previously baked or burnt, to destroy the organic matter in it, or with silver sand, and keep this earth or sand thoroughly moistened morning and night, using hot water to wet the earth the last thing before putting back the eggs. If the evaporation thus caused is *still* insufficient*,

* In case of a very dry position.

one or other of the following plans can be tried : Additional "earth-trays" can be placed in the egg drawer itself. They are made to go into each corner of the egg drawer, thus avoiding too great a loss of space, and being in as high a temperature as the eggs themselves, the evaporation from these is greater than from the underneath trays. If these trays are used in the egg drawer, never put into them water hotter than 150° or you will risk damaging the row of eggs next to the tray. Some rooms with boarded floors are so dry that it will be found an advantage to use these extra "earth-trays," and also to keep a couple of pans of damp earth on the floor underneath the ventilators of the incubator, and the evaporation from them will modify the extreme dryness of the atmosphere. People with properly built incubator rooms keep a few inches of moist sand on the floor and purposely spill plenty of hot water about every day. Remember that a close room, insufficiency of fresh air in the hatching room, continuous gas or lamp burning, are all great causes of a tough membrane. If the position chosen is at all suitable, with good ventilation, and abundance of fresh pure air, the chicks will free themselves from the shell quite clean and clear at the proper time, but the hints above are given, as "Hydro-Incubators" manage occasionally to get worked in such peculiarly unsuitable positions.

After 48 hours incubation, the fertile eggs can be selected by a person with experience by the aid of the Tell-tale Egg Tester; but, on the sixth day the eggs should be carefully examined again and the non-fertile ones removed. It will be better to have the "Hydro-Incubator" half empty than allow these to remain in it.

Some workers have become so practised that after the eggs have been cooled for 20 minutes, they can detect those with live germs in them by the heat they retain, whereas infertile eggs grow cold very rapidly.

On the twentieth day if the eggs are fresh, or the twenty-second day if they are stale, the hatching should take place; be careful to turn the chipped or pecked portion of the shell to the air, but still keep to the regular times for visiting the apparatus. At each visit, take away all the chicks hatched, meanwhile leaving the others for another 12 hours. Remember that each chick removed lessens, by a regular proportion, the heat of the drawer, therefore increase the supply of water accordingly. If many chicks hatch out at once

this lowering of the heat is considerable, and is of course guarded against by an extra supply of boiling water at such times.

The bath thermometer, ranging from 32° up to boiling-point, is to test the water as it passes through the funnel into the cistern at E, and to tell the heat of the room, and for general purposes. It should be remembered that 212° is the boiling-point of water, and the nearer to this temperature the incoming water is, the less of it will be required. Much importance is to be attached to this point, as many people consider water boiling, when in reality it is only some 190°. It is well worth testing, as not one servant in a hundred has any idea of what really constitutes boiling water.

To insure success with a "Hydro-Incubator," particular attention must be paid to the most important points, briefly recapitulated as follows:—

1. When *starting*, fill twice with boiling water and allow two days for the heat to settle in the drawer and to practise, before putting in the eggs.

2. See that your eggs are fresh and good, and, if possible, *from hens—not pullets*.

3. Don't exceed 106° or go below 102°.

4. Examine all the eggs with the "tell-tale" on the sixth or seventh day, and reject those that are infertile. The drawer can be filled up with fresh eggs properly warmed, if desired.

5. Only open the drawer at the regular hours, except perhaps when chicks are expected, when it may be opened for a few minutes at noon.

6. Keep the false front always shut while the drawer is out, to keep the heat in.

7. In case of a smell existing in the egg drawer, place therein a small lump of quicklime, to act as a disinfectant.

8. Avoid draughts and cold as far as possible, but give plenty of air and open the windows or door of the hatching room at least once every day so as to keep the air of such room pure and sweet.

9. Be most careful to stimulate evaporation by means of the "earth trays."

10. Nothing must ever be placed between the eggs and the cistern, but in cold weather the thickness of flannel underneath the eggs may be doubled with advantage.

11. In turning the eggs, the outside ones should go inside, and those at the front replace the back rows *occasionally*. Thus, all in turn will occupy each part of the drawer.

12. Before purchasing eggs for a Hydro-Incubator, read "Hints on Eggs," p. 46. You can with the Egg-Tester see if they have a large air space and are stale.

13. See that the bulb end of the Thermometer is slightly lower than the other end, so that the mercury can run back freely as it cools.

A little forethought will often save a world of labour and trouble. In a severe winter, persons not possessed of much accommodation, and working in places where the temperature keeps low, will do well to study the following suggestions, as they save much labour: 1st—The ventilators on both sides may be stopped for the first nine days; and 2ndly—The flannel can be doubled. 3rd—A cosy (made with an adjustable flap so that the ventilators can be closed or opened at will) or a blanket thrown over the whole Machine will keep off draughts. 4th—A few quarts of boiling water in between the usual times will work wonders.—"*Aux grands maux les grands remedes*;" or, lastly and best—A Circulating Boiler can be fitted to any Hydro-Incubator working on this "old system," doing away entirely with the necessity of drawing off any water at all, the whole work being done by circulation.

Workers with "Hydro-Incubators" should always keep a register (like those kept at the Ayr and Hemel Hempstead Shows), and then, in case of any hitch or difficulty, I know what course to advise, if this register is sent me.

Precisely the same rules apply to the working of the 250-egg "Hydro-Incubator," allowing, of course, an extra supply of boiling water for the extra size of the machine. Proportionately, a 250-egg "Hydro-Incubator" requires less water than a 90-egg one. The proportion is somewhere about 5 gallons to 3 gallons. These, the fashionable Incubators for pheasant hatching, are still more reliable than the Gold Medal 90-egg pattern. The cistern is so large that a variation of outside temperature is not appreciable. The two drawers are very convenient, and are now being made with rising and falling floors, so that by simply turning a screw, the perforated zinc bottom

is either brought nearer the tank, or further from it. The benefits of this addition are obvious—it simplifies the regularisation of heat in the two drawers, which before was difficult to do, unless there were the same number of fertile eggs at precisely the same stage of incubation in each drawer. With pheasants you do not, of course, want so deep a drawer, so you turn the screw and up rises the floor. Again, when hatching out you like more space—a few turns of the screw, and the floor is an inch and a half lower.

The accompanying drawing fully explains the appearance of the 250-egg “Hydro-Incubator,”—the “Commercial.” Of course, in India, at the Cape, and in other hot climates a far less supply of boiling water suffices.



250-EGG HYDRO-INCUBATOR—"THE COMMERCIAL."

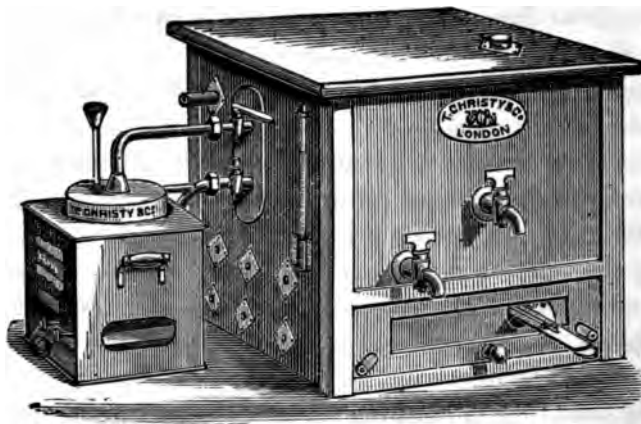
A drawer support on folding legs is a great convenience, as it saves lifting the drawer about, which, considering the weight of so many eggs, is of importance, especially to Lady workers of "Hydro-Incubators." Pulling the drawer out steadily in this way on to the stand or support, saves much jarring and jerking of the eggs. While on this subject, I may make the following suggestion to any one not working with a drawer full of eggs, to obviate the rolling about: Put small staples, similar to those used for fastening fencing on to woodwork, at each end of the drawer *inside*, about three-fourths of an inch from the perforated zinc bottom. Each staple should be the breadth of an egg away from the next one to it. Then lace a piece of narrow tape from back to front of the drawer,

making regular lines, and though you only have a dozen eggs in the drawer, they will be quite firm, supported as they would be by the tape stretched tightly across from back to front of the drawer, on both sides of each egg.

To meet every demand, that of the poor man equally with the well-to-do class, I have had constructed a "Cottager 90-egg Hydro-Incubator." The saving of cost is effected principally in the material forming the outer casing, and in doing away with the water gauge. Pipes and taps are also smaller, and the work of course not as well finished. It is, however, a strong sound Incubator, many of this pattern doing excellent work all over the country.

The same rules of hatching apply to all eggs. The heat required in the egg drawer is the same, whether for ostriches, for fowls, for ducks, turkeys, pheasants, partridge, or goose eggs, namely 102° to 106° . One point must be remembered, however, and that is, you want the thermometer always kept at the level of the top of the eggs. This makes a material difference, for if you have a partridge egg and the thermometer arranged on its slide to reach the same level as this egg, a goose egg next it, would really be in a temperature nearly 3° higher than that registered by the thermometer. Both goose eggs and duck eggs require more moisture than any others, but are not so sensitive to absolute purity of the air in the hatching room as are ordinary hens' eggs.

I have now fully explained the theory of a "Hydro-Incubator," and given the rules for working it by the old system of re-charging with boiling water every 12 hours. I now come to describe the usual system, of working single "Hydro-Incubators" viz., by means of the outside Circulating Boiler.

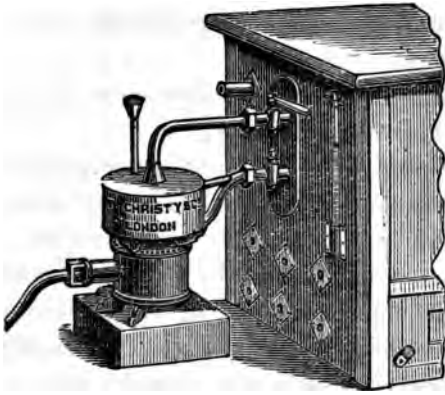


HYDRO-INCUBATOR
FITTED WITH OUTSIDE CIRCULATING BOILER,
Obviating all change of water night and morning.

1. To start this machine, fill the inside cistern with water (15 gallons for a 90-egg machine), and also the outside circulating boiler. Apply a heating power to the latter, viz., a gas stove, oil stove, or the kitchen fire itself can easily be made to serve this purpose, and you will at once commence to heat the upper portion of the water in the cistern. When this gets up to say 160° or 170° (as tested with an ordinary bath thermometer by running a quarter-of-a-pint of water from the middle tap over the mercury bulb), draw out 3 or 4 gallons of water from the lower tap, at once replacing same through the top inlet pipe. In a few hours in this way you can get the machine thoroughly warmed through, and the drawer-temperature up to 104° , or whatever heat you wish. The operation of starting will of course be very much quicker if you fill the "Hydro-Incubator" in the first place with quite hot water instead of cold.

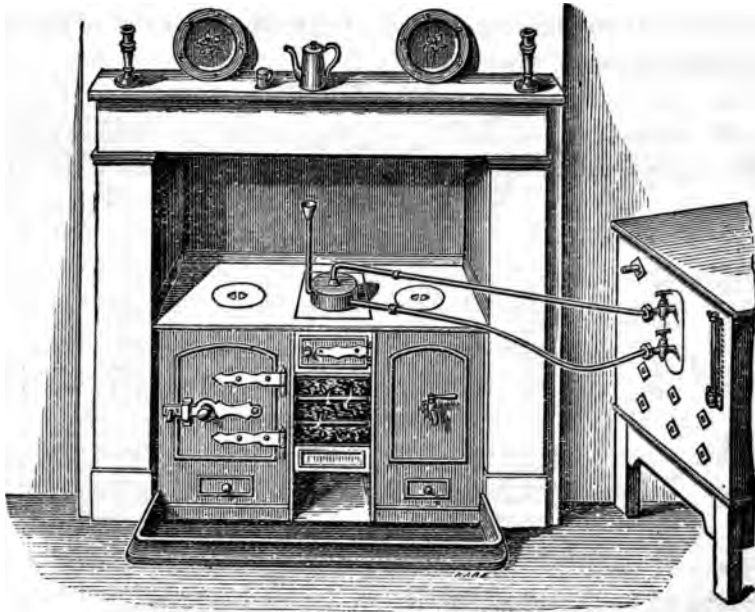
2. Continue working for 2 days at least before putting in the eggs. With the old pattern "Hydro-Incubator" you work by withdrawing every 12 hours from (say) 2 to 4 gallons of water from the middle tap, and re-charging the machine with a similar quantity of water poured in boiling. By applying heat underneath the outside boiler you produce exactly the same result, that is, you raise the temperature of the top stratum of water as much as is required to keep the lower stratum of water sufficiently hot for 12 hours or longer if required.

3. With one of Fletcher's solid-flame gas stoves (as supplied by us at 7s. 6d.) you can raise the temperature of the water



40° in one hour, which is more than would ever be required, unless you were working in an extremely cold place, or wanted to leave the machine for a longer period than 12 hours. A Ripplingille patent oil-stove and lamp (price 15s) would effect a rise of temperature of 20° (which is generally sufficient) in about

one hour. As already stated, when so desired, the outside boiler can be constructed to work on the kitchen fire or in any open grate, as shewn in the drawing.



RULES OF WORKING.

Start the Hydro-Incubator as shown above, and only consider it properly started when your thermometer in the egg drawer shows

a heat of not less than 104° . This heat obtained, leave the machine 12 hours, when it will require the following attention :—

1. Fill up the incubator cistern by adding 1 pint or so of water at about 150° by the top inlet pipe.

2. Ascertain the temperature in the egg drawer by pulling out the thermometer. Note this on the Register.

3. Note down the temperature of the water from centre tap by running a quarter-of-a-pint of water over the mercury bulb of a bath thermometer. Replace this water.

4. Proceed to heat the outside cistern by burning underneath it the gas stove or oil lamp, or by placing it on the fire, until you have raised the heat of water from middle tap sufficiently. Then leave the machine 12 hours and look at the egg-drawer thermometer. If you have lost heat in the drawer, burn the gas or lamp for a longer time, so as to heat the water to a higher temperature than before; leave for another 12 hours, and in this way a couple of days' practice will perfect you in the art of regulating and keeping up the heat in the egg drawer. I give the record of a few days working, to show what I mean :

GAS REGISTER.

Date. 1881.	Temperature of Atmosphere in Working Room.		Heat of Water from centre tap, tested before heat- ing outside boiler.		Temperature in the egg drawer.		Heated by Gas Stove for hrs. mins.		Heat of Water from centre tap, tested after heating outside boiler.		Temperature of lower tap before heating.	
	Morn.	Night.	Morn.	Night.	Morn.	Night.	Morning. hrs. mins.	Night. hrs. mins.	Morn.	Night.	Morn.	Night.
Jan. 25	41	40	144	146	103	102	1 10	1 10	182	181	124	125
" 26	36	40	143	145	104	105	1 10	—	184	184	124	123
" 27	44	48	141	147	105½	106	— 50	— 50	178	174	—	126
" 28	48	50	142	144	105½	104	1 5	— 45	172	174	—	122
" 29	—	—	142	144	106	106	1 10	— 50	170	172	—	126
" 30	52	56	140	142	108	104	— 50	— 40	158	154	123	122
" 31	50	51	138	140	104	103	1 —	— 45	153	162	120	120

LAMP REGISTER.

Date. 1881.	Temperature in working room.		Heat of water from centre tap, tested before heat- ing outside boiler.		Temperature in egg drawer.		Heated by Oil Lamp for hrs. mins.		Heat of water from centre tap, tested after heating outside boiler.		Temperature of lower tap before heating.	
	Morn.	Night.	Morn.	Night.	Morn.	Night.	Morning. hrs. mins.	Night. hrs. mins.	Morn.	Night.	Morn.	Night.
Mar. 3	42	46	146	146	105	105	1 20	1 10	166	161	"	"
" 4	41	59	141	140	104	104	1 10	1 10	160	160	"	"
" 5	42	51	140	135	106	104	1 —	1 —	151	145	"	"
" 6	52	53	132	138	103	104	1 10	1 5	150	150	"	"
" 7	54	53	136	135	106	105	— 55	1 —	145	146	"	"
" 8	52	51	135	137	103	103	1 5	1 10	150	155	"	"

5 Light the lamp or gas 5 to 10 minutes before turning the cocks which open the communication between the two cisterns.

6. Turn off the cocks between the cisterns directly you have heated the water sufficiently and put out your lamp.*

7. Always have a window open when a gas stove or oil lamp is burning, and for 10 minutes afterwards, to get rid of any smell.

8. Keep a receptacle underneath the rubber tubing attached to the overflow pipe while heating the outside boiler, for as the water increases in heat it swells and overflows.

9. The regulation is precisely the same as formerly. Whereas by adding boiling water you keep up the temperature of the main body of water in the cistern of the "old system" Hydro-Incubator, so by circulation you can effect the same object. By adding more or less of such boiling water you gradually raise or lower the temperature in the egg drawer. You do precisely the same by circulation, and the "regulator" formed by the length of time you burn the lamp or gas, and checked by the rising of the temperature of the water as drawn from the middle tap, is more exact than the old principle of working, and quite as simple.

10. As formerly, allowance must be made in anticipation if very cold weather is expected. You add more boiling water in an ordinary Hydro-Incubator; in the one fitted with the outside boiler you burn the lamp a little longer than usual, both operations producing precisely the same result, viz., of raising the temperature of the body of water in the upper cistern.

11. As formerly, the only way of suddenly raising the temperature of the egg drawer is by taking water from the bottom tap, thus letting down a stratum of hotter water. Never, therefore, use this lowest tap once the eggs are in, except in cases of dire necessity, or for testing purposes.

12. Always cork and cover the ventilators with the screen provided, during the time the lamp or gas is burning, then unstop the air holes (except during the first 10 days of incubation) and remove the screen.

13. When using a lamp, wipe it before and after burning, and avoid the bad smell caused by a dirty or untrimmed lamp.† Never touch the eggs after you have trimmed the oil lamp, without previously washing your hands.

*Should the water be forgotten and get heated too much, pour in a little cold water at the filling pipe until middle tap registers as required.

† Don't quite fill the lamp reservoir, but leave one-third of the space for expansion of the oil.

TREATMENT OF THE EGGS.

1. Never place the eggs in the drawer until the machine is well started, and its working thoroughly understood, and the temperature steady at 103° to 106° for hens' or ducks' eggs.

2. Remove the egg drawer every twelve hours to turn and cool the eggs, for preference in a neighbouring room, so as to be perfectly free from any fumes from the gas stove, &c. In the morning for twenty minutes, in the evening for fifteen minutes.

3. The eggs are placed on a sheet of flannel resting on perforated zinc, below which are two iron evaporating pans. Attend to these carefully, keeping them half full of damp sand or of burnt earth, wetted night and morning with fresh hot water (150° to 180°).

4. Test the eggs on 7th and again on 15th days, rejecting all clear and bad eggs.

5. When working in rooms with boarded floors, or when hatching ducks' eggs, apply for extra earth trays to provide more moisture.

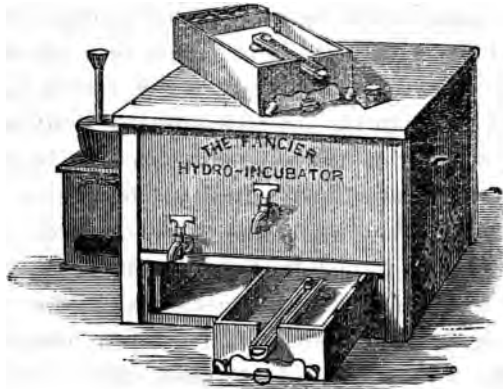
6. For the last few days of incubation keep the cover slip of the thermometer open to provide more air.

Any old pattern "Hydro-Incubator" can be fitted with the Circulating Boiler attachment, as just described; in fact, I have already fitted *several hundred* old pattern machines with it, amongst them being some French ones, both of Messrs. Roullier's and Voiteillier's make.

"THE FANCIER" HYDRO-INCUBATOR.

Designed and built to the order of A. COMYNS, Esq., Hon. Sec. to the Poultry Club.

The Special Advantages of the "Fancier" are that (1.) Fresh eggs can be added every day without injury to those already in the drawer, and (2.) That for 10 days the eggs are kept in a close steamy atmosphere and then transferred to drawer No. 2, where they receive an abundance of fresh air. (3.) When hatching out, more room can be allowed the chicks by lowering the false bottom of the egg drawer.



THE "FANCIER" HYDRO-INCUBATOR.

*Reprinted verbatim from the "Journal of Horticulture,"
January 13th, 1881 (page 38).*

During the past two seasons I have been employing "Hydro-Incubators" instead of hens for hatching my Dark Brahma chickens. The first season I had but one Incubator, and put in the eggs as they were laid. Finding, however, that more successful results were attained by placing the entire batch of eggs in the machine at once, closing all the ventilators, and thus keeping a close moist atmosphere for the first eight or nine days, and ventilating freely for the remainder of the twenty-one days, I last year worked two Incubators. No. 1 was unventilated and kept very moist with a temperature of about 102°; No. 2 was thoroughly ventilated, not quite so moist, and kept at about 104°. The eggs were as they were laid placed in No. 1, and left there for eight days. The fertile eggs were then moved into No. 2, where they remained for the residue of the period of Incubation.

This system worked fairly well, but there were two points capable of improvement; firstly, placing cold eggs amongst those some days advanced in the hatching process was objectionable; and secondly, the necessity of keeping two Incubators at work involved much extra trouble. I wished for a machine which would combine in itself the qualities of the two Incubators, and would also be suitable for ordinary fanciers who cannot possibly set ninety eggs at a time, but only a few each day.

The idea of a machine with two drawers, the one ventilated and the other unventilated, at once occurred to me, but I also thought there would be considerable difficulty in maintaining an equal

temperature in two drawers deriving their heat from the same source but under dissimilar conditions as to ventilation. It also struck me that this unevenness of temperature might be, to a great extent, corrected by the eggs in the ventilated drawer being well on in the hatching process, and thus throwing out some heat themselves, while those in the unventilated drawer, not yet having an independent blood circulation, would absorb much of the superfluous heat.

I was ignorant as to how far these conditions would affect the result, while I knew from experience that a greater or less space between the eggs and the bottom of the cistern caused a material difference in the temperature. I therefore came to the conclusion that, by having the false bottoms of the drawers made capable of being raised and lowered by means of screws, any inequality of temperature might be met by increasing or diminishing the distance between the eggs and the source of heat.

A moveable division in the unventilated drawer would, I thought, obviate the difficulty as to putting cold eggs into the machine. I talked the matter over with Mr. Christy, and the result of our conversation was the construction of "the Fancier" Hydro-Incubator in an experimental form. A division was inserted in the drawer-space of an ordinary ninety-egg Hydro-Incubator so as to accommodate two drawers, No. 1 containing thirty-six eggs, No. 2 containing forty-eight eggs. The false bottoms of both these drawers were made to move up and down to the extent of 2 inches, and in No. 1 there was a moveable division which fitted into slits cut in the sides of the drawer. No. 1 was unventilated, No. 2 thoroughly ventilated.

This Incubator was sent to my rooms at Herne Hill on the 26th of November; I at once got it to work, and on the 1st December I put a dozen eggs (Leghorns and farm cross) in No. 1. On the 2nd December I placed in twelve eggs more, and on the 3rd another dozen. The second and third lots were each for one day kept shut off from the rest of the drawer by the division. As soon as each dozen had been in nine days, they were taken out of No. 1, tested for fertility, and the fertile eggs placed in No. 2. On the 14th, 17th, 21st, and 24th December respectively an additional dozen eggs were put in No. 1. Twenty-eight of the first three dozen contained living germs when tested (the remaining eight being clear or addled), and there was therefore at one period one drawer full of eggs only a few days in, and the other containing twenty-eight eggs with well-

developed chicks in them. I found that, although when both drawers were empty No. 1 was about 2° hotter than No. 2, yet when the stage already indicated was reached, No. 1 at an equal distance from the cistern was 5° or 6° colder than No. 2. I therefore gradually raised No. 1 and lowered No. 2. I found it necessary to go to the extreme limit of difference of height possible, and to put No. 1 two inches nearer the cistern than No. 2, before I could attain the heat I desired—namely, 102° in No. 1, and 104° in No. 2. The screws, however, gave me sufficient scope to obtain the desired temperatures, and have since afforded the means of meeting any variations caused by the removal of live chicks.

Now as to the hatching results. From the twenty-eight fertile eggs, twenty-four fine healthy chicks hatched out, generally a day before they were due. One of the remaining four eggs produced a live chick, but it was a monstrosity and died at once. Two others died in the shell, when ready to hatch out, from their heads being so placed that they could not reach the shell with their beaks. The fourth was the only failure which could be attributed to any fault in the hatching, as it contained a dead chick of about seventeen or eighteen days' growth.

These results I consider most satisfactory; and indeed, taking into account the season of the year, that the eggs had travelled by rail from Brandon, and that some of the second dozen were at least a week laid, I think the hatch wonderful. I have only to add, that by the method of working which I adopted—namely, keeping a small gas stove constantly alight in the fireplace with a four-gallon pot of water upon it, and replacing the boiling water used by what I drew off from the Incubator, the trouble and time consumed were reduced to a minimum; the atmosphere of my room was not in any way vitiated, and the expense was kept low. The average consumption of water was three gallons night and morning. The temperature of the room varied from 50° to 60° .

I believe that Messrs. Christy intend to make "the Fancier" rather larger than the experimental one—namely, to contain one hundred eggs in all, forty-five in No. 1, and fifty-five in No. 2 or thereabouts. This would give a steady setting capacity of five eggs per day, or fifteen every third day, and would probably suit the wants of many who now cannot use an Incubator. "The Fancier" could of course be fitted with the new heating apparatus.—ALEX. CO.

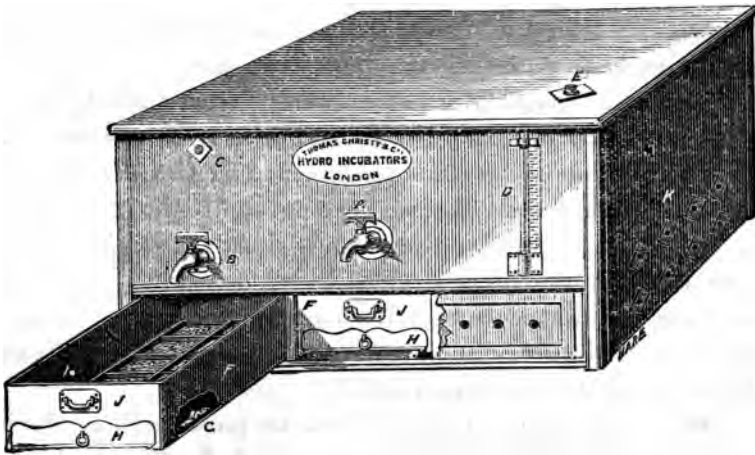
Mr. Comyns' description is so full and so clear that I c

better than leave it to serve for the working instructions. One thing only need I add, and that is, that "Fancier" Hydro-Incubators are generally made with Drawer No. 1 for 45 eggs, Drawer No. 2 for 55 eggs. This arrangement, however, is a mere detail, and can be altered to suit anyone's convenience. For instance, it might suit many people to have No. 1 made to contain, say 60 eggs, and to put this number in at starting, which, after weeding out the unfertile eggs, would probably leave 40 good eggs to go into Drawer No. 2 from the eighth or tenth day.



THREE-DOZEN EGG HYDRO-INCUBATOR.

Here is the latest novelty! A small-sized "Hydro-Incubator," to hold three dozen eggs. Although so small, it gives most excellent results. It should be placed in a warm room (such as an ordinary kitchen), between 60° and 70°, and attended to either night and morning, or else three times during the 24 hours, say at 7 or 8 a.m. at 3 p.m., and 10 p.m., giving it a gallon of boiling water each time. The same instructions as for the larger pattern "Hydro-Incubators" apply to its general treatment. It is extremely handy; portable, needing no stand, and is sent away ready for working. I think every one using hens should always carefully keep a small-size incubator handy, and in case a sitting or two sittings are deserted, the eggs need not be lost. Its great advantage is, however, for the small fancier or small poultry keeper, who wants his dozen or two dozen chicks earlier in the year than he can get them by his sitting hens. Like all my other Incubators, I have had this one worked by different people, and under various circumstances, before I would allow it to be offered to the public; but, having proved its working powers, I do so now without hesitation, and believe it will be much appreciated by the smaller class of poultry keepers at least. If so desired, it can be had fitted with a Circulating Boiler, and an oil lamp to heat it night and morning.



OSTRICH HYDRO-INCUBATORS.

Last in my description of the various patterns of "Hydro-Incubators," I come to those specially built for ostrich eggs. At the Cape of Good Hope artificial incubation is a far more familiar subject than at home, for with such unwieldy birds, ostrich farmers were forcibly compelled to seek out other means of hatching the young ones, instead of leaving the parent birds to do this part of the work. Again, a hen ostrich, if her eggs are removed, will keep on laying. Mr. THOS. NILAND, of Mount Pleasant, as reported in the *Eastern Star*, had one which laid him 120 eggs, supplying five of his small "Hydro-Incubators." Now when ostrich chicks realise from £5 to £10 each, I leave my readers to judge how long a "Hydro-Incubator,"—costing £12 or £15 delivered at the Cape—would take in paying for itself. As regards their efficiency for hatching these large eggs, let my correspondents speak for themselves:

PORT ELIZABETH.

DEAR SIR,

Through Messrs. Edenborough Brothers I received one of your Hydro-Incubators, and having fairly tested its qualities, can strongly recommend this valuable invention to all Ostrich Farmers who may desire to become possessed of an Incubator for hatching Ostrich eggs. The simple manner and inexpensive mode of arriving at the desired result is of great advantage, and I only hope that you may shortly obtain large orders from the farmers here who have Ostriches. Assuring you that I will do all in my power to spread far and wide, and recommend your valuable invention,

I remain, Dear Sir,

THOS. A. VERMACATER.

Ostrich Farmer, at the Farm Gorat,
District Uitenhage, South Africa.

Ostrich farming is spreading rapidly to other countries, notably to the Argentine Republic. Messrs. Hill, Protheroe and Co., of

Buenos Ayres, I suppose the largest people in the Republic engaged in this pursuit, inform me (Aug., 1881) of the following interesting facts in connection with their farming operations:—

“ We lately brought over to this country from Cape Colony a shipment of 200 ostriches, our intention being to establish ourselves here as ostrich breeders and importers, and from what we have seen of the pasture, &c., we have not the slightest doubts of the undertaking. Another gentleman is already farming here with about 150 birds, nearly 50 of which he has reared in this country, using your Hydro-Incubator. We hope to be large importers of South African ostriches, and are now expecting a second shipment of breeding birds from Cape Town.”

“ We enclose a copy of a small book we published on ‘ Ostrich Farming,’ and you will observe on page 14 that we recommend your Incubator as the best yet invented.”*

The rules of working Ostrich “ Hydro-Incubators ” are precisely those given in a preceding chapter for the smaller machines for hens’ eggs, &c., allowing for various sizes as required. The usual patterns are a 12-egg size machine, a 24-egg†, a 36-egg‡ size, and larger ones up to 99 eggs, one of which “ Giant Incubators ” we supplied to Mr. G. Chatfield, at Bloemfontein, and which obtained his hearty approval.

Ostrich Egg Testers and Ostrich Rearers are also made, but the description given in another part of this book for these appliances will fully explain their use and working, only allowing for their being made on a larger scale, in accordance with the difference of the size of the eggs and of the birds.

The young Ostriches are very tender, and lately many farmers have learnt to consider a Rearer almost as important as the Incubator itself. Messrs. W. G. Clarke & Sons, of the Anchor Patent Biscuit Works, London, have been giving this industry their attention, and have produced a manufactured food made up in cakes for the grown Ostriches, and in the form of meal for the young birds. The analysis proves its nutritive character, and its makers say its constant use entirely prevents worms. We all know the

* *Los Avestruces Sud-Africanos*, published by J. H. Kidd, Buenos Ayres, p. 14: “ El mejor aparato de incubacion conocido hasta hoy es el “ Hidro-Incubador ” de Christy, por medio del cual casi la totalidad de los huevos fértiles producen polluelos sanos.”

† No. 1 on the Price List.

‡ No. 2 on the Price List.

importance of this feature, and I therefore draw my readers' attention to Messrs. Clarke's Ostrich Food. It is of a nature also to stimulate the growth of feathers—giving lustre to the plumage, they say.

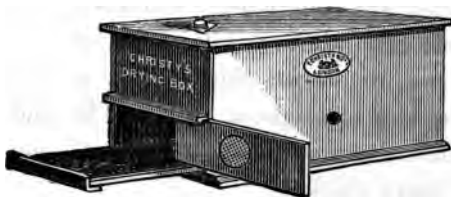
Ostrich "Hydro-Incubators" can of course be worked on the two systems :—

- 1st.—By partially recharging the cistern with Boiling Water each night and morning (Old System).
- 2nd.—By means of an Outside Circulating Boiler, heated by Gas or Oil, or from the kitchen-range, obviating all change of water (New System).

ARTIFICIAL CHICKEN AND GAME REARING.

The chicks hatched out, it is now time to think of what is to be done with them.

In the first place, not the slightest fear need be entertained of harm in the event of their hatching out some hours before the egg drawer is again visited. Though in the drawer 12 hours, they would not hurt. As soon as discovered to be clear of their shells, they should be placed in the DRYING BOX.



A basket placed in front of the kitchen fire was found to work very well during the day time, but when night came, it meant either getting out of bed two or three times to make up the fire, or losing

the newly-hatched chickens. The drying box is provided with a padded tank lined with flannel underneath, this is filled 12 hours before required with boiling water. The chicks nestle underneath the flannel, just as they would under a hen, or as they do later on, under the Hydro-Rearing Mothers. Felt or flannel is put on the floor of the drying box, the tank emptied, and the whole aired and cleaned after the probationary 24 hours between the Incubator drawer and the Rearing Mother has been passed by the chicks. A thermometer pressed up against the felt under the cistern in the drying box should give about 80°. The drying box can be used for the first few days, if desired, but a quart or so of water must be taken out and replaced boiling every

12 hours. Cover the top with a thick rug at night-time, and always leave it in a warm room.

After 24 hours passed in the drying box the chicks will be found crying lustily for food, and are then transferred into one of the Rearing Mothers described in the following pages.

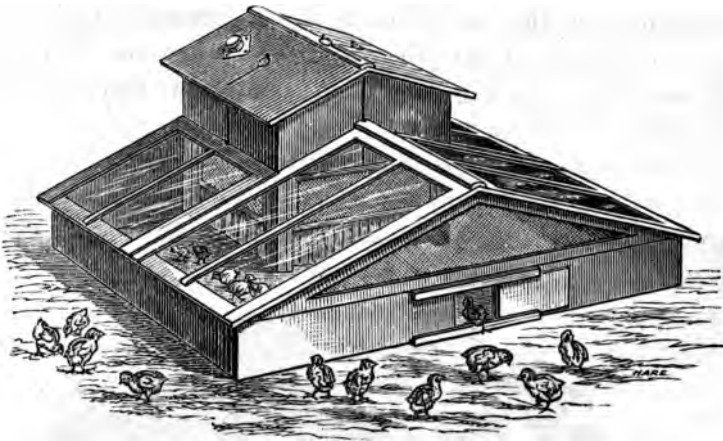
Before entering into the minute description of the different kinds of Rearers, I should like to say a word as to the artificial rearing of chickens in general.

Some authorities on poultry matters, after being driven from their old ground of absolute incredulity as to the hatching of chickens by incubators, have now adopted the cry of, "Oh! you can't rear them." I have not space here to go as fully into the matter as I did in my two letters published in the *Field*, of January 10th and January 17th, 1880, respectively, when I quoted a few of the most recent results which had occurred within my own knowledge. Let me recommend all doubters as to artificial rearing to read the very able article of Mr. Lewis Wright, which appeared in the issue dated January 16th, 1880, of the *Live Stock Journal*. The secret of success with Artificial Rearers is to heat them moderately, and to have abundance of fresh air. If you provide an Artificial Rearer for warmth, frames or shedding to keep them dry, and allow free access to the open air, your chicks will thrive, no matter how cold the weather, but *don't* try to coddle them indoors, or you will inevitably fail. Warm rooms for chickens are a vast mistake. They look splendid up to a fortnight or three weeks, and then off they go, one after the other, to your utter despair. Cramp. and weak legs will account for every chick.

OPEN-AIR MOTHER, OR GAME REARER.

This is an improved and adapted form of Hydro-Rearing Mother, especially suitable for Poultry, Pheasants, Partridges, and all kinds of Game.

The centre-part of Open-air Rearer, containing the Hot-water Tank, is made with a sloping roof to resist the weather, and is placed in a large park or tray, the sides of which support (on three sides), removable glass frames, serving as protection to the young birds from wind, wet and cold, well ventilated by small holes in the top framing, and by the perforated zinc front. In fine weather the glasses can be raised, and the door in the park opened to let the



OPEN-AIR MOTHER, OR GAME REARER.

birds out on a grass enclosure, which should be constructed with wire fencing. In wet and cold weather they still have the advantage of a fine large dry run, where they are fed. On hot sunny days it will be better to remove the frames altogether.

Let your chicks out every day, no matter how cold (but choosing dry moments), after the fourth or fifth day, at first for only a few minutes, gradually increasing their airing until in a week or a fortnight, according to circumstances, they may be left to run in and out just as they please.

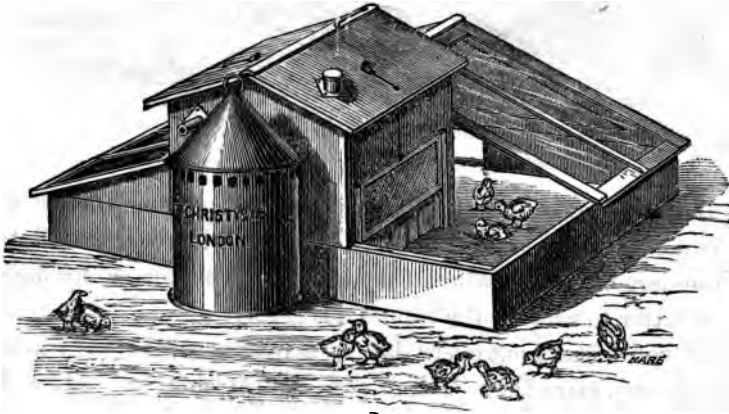
The Open-air Rearer is heated in precisely the same way as the "Hydro-Incubator," by filling it with boiling water through a funnel, leaving it for twelve hours, and afterwards keeping up the temperature by a supply of boiling water once or twice a day, from one to two gallons each time, or more, if necessary. The operator must judge the quantity, according to the temperature of the atmosphere, making allowance for its variations, and also proportionately to the number of chicks contained in the artificial mother. The best temperature to keep up is about 60° to 70° , but by pressing the hand up towards the loose flannel, lining the bottom of the cistern, it can be at once determined if the heat on the backs of the young birds is sufficient or not.

The first night or two the sliding ventilated zinc doors can be closed, if judged advisable, and if the weather is very cold; but afterwards they should always be raised during the night, for if the chickens feel too cramped for space, or too warm under the mother, they should be able to go outside into the fresh air.

Leaving open the zinc slides is also a guarantee against the danger of crushing and trampling, as, if the weaker ones are pushed by the stronger chicks, they simply come out into the tray, run round to the other side, and go in there.

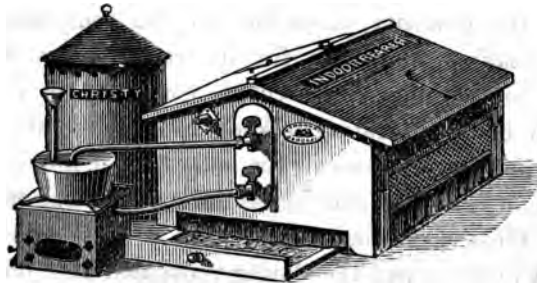
The instructions as to feeding are given later on.

The felt or woollen lining, which is very cheap, should be replaced every three or four months, if in continual work. Cleanliness cannot be made too great a point of.



When the Rearing Mother is done with, do not empty out the water until again required, as it will prevent the tank rusting if kept full of water.

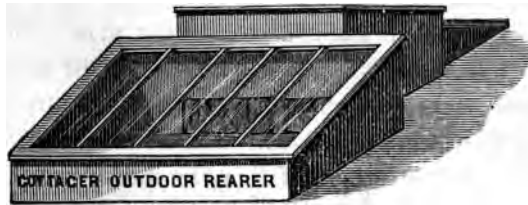
If the Hydro-Rearing Mother (the indoor pattern), is being used, it is prepared as follows for their reception:—The “Mother” is placed on the floor of the shed or building in which it is going to be used, first putting underneath it a bed of sifted ashes, dry earth or



sand, which can of course be made high or low according to the requirements of the chicks and to suit their ages. The side on which is the tap for drawing off the water morning and evening, should be so placed as to allow of its being run away through

rubber piping into a bucket. The INDOOR HYDRO-REARING MOTHER here shewn is heated by an outside boiler and lamp. The screen enables this to be worked in an open shed, or in any draught. This attachment can be supplied, of course, to any pattern of Rearing Mother.

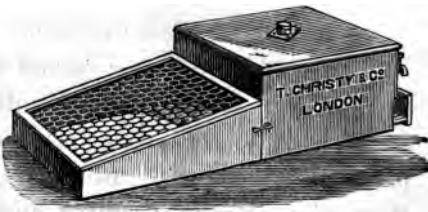
Large separate GLASS-COVERED RUNS with tops and ends removable, wooden sides and bottoms, and 2 sliding doors, are very useful adjuncts about the place. Besides being put in front of the Rearers they serve most usefully for chicks three to six weeks old as night shelters, and protectors from vermin or cats.

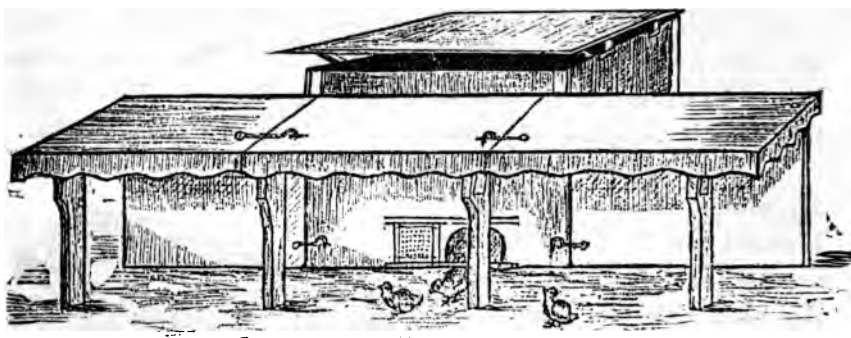


THE COTTAGER'S OUT-DOOR REARER

A cheapened form of Open-air Rearer, of course of a much rougher build, and without any of the appurtenances which tend to make the standard pattern so complete. It is worked precisely the same as the Open-air Rearer, but has not the zinc slides belonging to that pattern preventing the crushing of the chicks.

This Cottager's Indoor Rearer has been brought out more in response to a demand, for a cheap auxiliary form of Mother to serve as a sort of "*Reserve Mother*" to prevent crowding. It was not originally intended as the only Rearing Mother used, although it has often served in that capacity, and is well spoken of by those who have used it in rooms or sheds. For durability or completeness, the "Cottager" cannot enter into competition with the kinds of Rearers just described, nor is its ventilation so perfect. It is made in two patterns, for out-doors and in-doors; a woodcut of each is shewn.





THE DRY MOTHER.

In summer-time a supplemental DRY MOTHER, to take the chicks from the Hydro-Rearers at three to four weeks old, until they are able to perch and look after themselves, will be found most useful.

A DRY MOTHER will take 100 chickens, and is furnished with a shelter in front for wet weather, which takes off in separate pieces, and the whole packs away inside and looks like an ordinary box, and is ready to be sent anywhere.

Inside is a felt covering to fall on the chicks' backs, and on which a little loose chaff should be sprinkled to render it stiffer for the young birds to press against. This felt lining is removable, and perches can be substituted, although, of course, fewer birds can perch than could nestle under the felt.

For cleaning purposes there is a door or slide the whole length of the back.

DRY MOTHERS of this pattern can be constructed any size, and will render great services in preventing overcrowding in the ordinary Rearing Mothers.

Should it be desired to do so, a few minutes work would convert one of these DRY MOTHERS into an admirable Double Sitting Box.

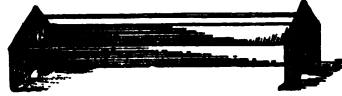
THE FEEDING OF YOUNG CHICKS.

For food, we should recommend as follows :—

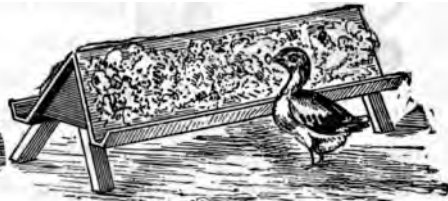
First 24 hours none ; second and third day, bread crumbs and chopped egg, crushed rice or millet, and boiled milk. From the fourth day. to the above-mentioned food may be added oatmeal porridge, mixed with either water or milk, or meal with curd. Raw onions, Prickly Comfrey, and lettuces cut up fine may also be given occasionally with great advantage, and as much variation made

in the diet as possible. For liquids, either milk, or milk and water, and this only from the fourth day, and then only sparingly.

Feed frequently, at first every two hours, giving freshly prepared food each time. Above all, never leave either milk or milk and water in their troughs more than one hour at a time. Zinc troughs, two sizes, arranged as those shewn here, with a bar along the whole length of them will be found the most useful. The bar helps to keep the birds out. If small troughs and more of them are used, it will be found a better plan than larger utensils.

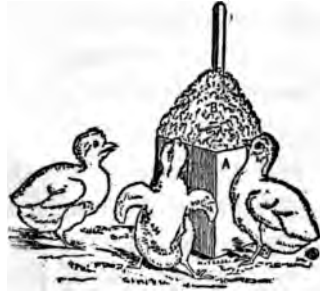
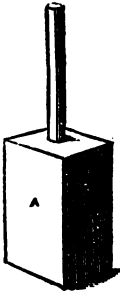


TROUGH FOR ADULT FOWLS.



"SHELF" FEEDING TROUGH.

A capital paste for chicks is made by putting five parts oatmeal to one part cooked rice, mixed with milk and given them while warm. This is very tasty, and very good for them. To prevent waste, and give the young birds a little occupation, pile up this paste on the little wooden pedestals, as shewn in the accompanying drawings.



Curd and Meal also makes a nice food for the chicks from a week old. The curd can most easily and quickly be made in small quantities, by putting the milk in a saucepan, and as soon as the milk comes to the boil, drop in a few grains of powdered alum, remove the saucepan, and after stirring once or twice the curd will form, and can be strained off through a cloth. For chicks a week old nothing is better or more *easy* of preparation than Spratt's Meal.

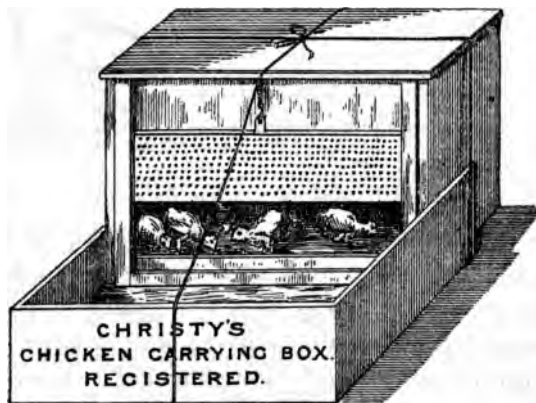
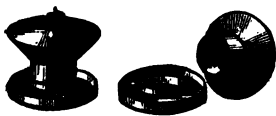
There is a great saving of food when the chicks are fed in this way, but care must be taken to keep the pedestals always under

cover; even in the grass runs there ought to be a building into which the chicks can take shelter, for they know when a shower is coming, and it keeps the food dry. The food that is placed on these pedestals should be carefully mixed to the consistency of dough, and not so loose that it will crumble off when pecked. Change of food is one of the greatest secrets of rearing fine birds, more particularly in cold weather, when they cannot get out of doors. It is better to have several Pedestals, with a small amount of food on each, than let the birds crowd round one and knock it over—dirt only upsets your birds.

Plenty of green food is indispensable, and the drinking vessels ought to be so constructed that it is impossible for the chicks to get wet by treading in them. Till they are a month old, milk or milk and water is the best beverage for them, and I prefer small drinking fountains, made so as to entirely prevent the young birds getting in them. The bottoms should be loose, to allow of their being well scalded out frequently. In purchasing powdered food, be certain nothing is bought but the ground grain, or occasionally you may be feeding with plaster of Paris instead of with oatmeal.

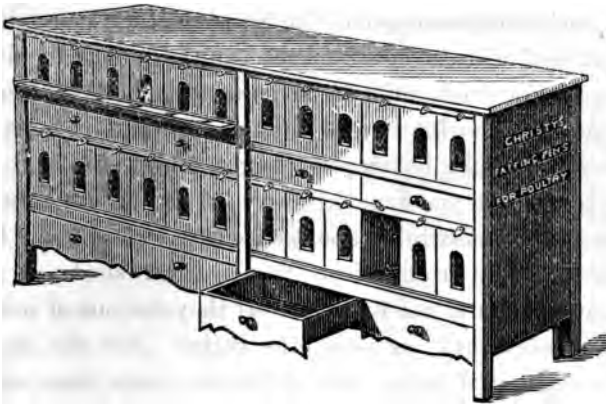
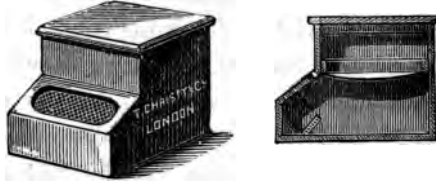
Fed liberally, in the manner described, a four-months chicken should weigh a good 4 lbs.

The "Carrying Box," with a loose tray and sliding door, can be made in more than one size. The birds can be liberated for a run



and fed in the open space. The whole shuts up into a small compass and is held fast by a cord. This must not be confounded with the

box in which chicks are packed when they are despatched by rail—without anyone accompanying them, which is a much cheaper and smaller thing, and of which I now give a separate sketch. In these small “Travelling Boxes” (and they must be kept down in size, as large ones do not answer) chicks 24 hours old can be sent long railway journeys. It is within my knowledge that six of these tiny chicks arrived safely in London from Gambais, France, a journey of at least 16 hours.

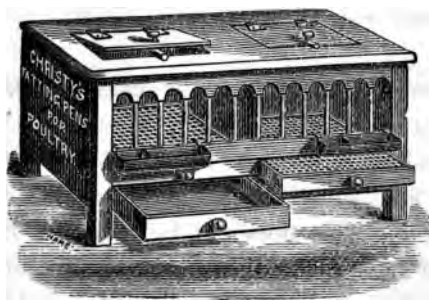


FATTENING PEN FOR 24 BIRDS.

The chickens thus reared are in the majority of cases destined for table purposes, and here I want to give a word of warning to amateur poultry breeders, as well as to farmers, who get their birds nicely grown and a good size, and who jump at once to the conclusion that they are marketable. This does not, however, follow. Your four months' chicken may have a big frame, and the making of a good table fowl, but people will not buy him if not “fit.” Unless he carries flesh on his frame and is decently killed and dressed, only disappointment will accrue when the account sales come in from your market man. These two points of putting a final finish on the birds, which really means fattening them for 10 or 14 days, and again, of properly dressing them, are of vital importance. It means to the producer the exact difference between profit and loss.

All things considered, the most certain way of effecting the first of these objects, is to shut them up for the time specified, viz., 10 to 14 days in properly constructed pens. In the first drawing I show a 24-bird fattening coop, in which each bird is confined by itself in a separate compartment, with moveable front, a trellis-work bottom, also removable, and trays to catch the manure. Troughs are placed in front for food and drink. These coops or pens are made in various sizes, viz., for 24 birds, for 12 birds, for 6 and for 4 birds, and the following is the treatment and food :—

Feed about every three hours, the earlier in the morning the first meal is given the better. Diet should consist of buckwheat meal mixed with skim milk to the consistency of crumbly dough. Next to buckwheat meal comes the Sussex ground oats mixed in the same way, and a little mutton suet can be added to either with advantage. For drink, milk in moderation is best. After feeding, remove the troughs for two to three hours, and then feed again. The drawers should be emptied night and morning; the loose bottoms taken out and scalded every 10 or 12 days, and if each compartment is lime-whited about once a month, it will be giving the system a fair trial. Keep the pens in sheds or buildings moderately warm and not too light. If they are out of sound of the other fowls at liberty, so much the better. For the first two or three days there will be no gain of weight; they then settle down

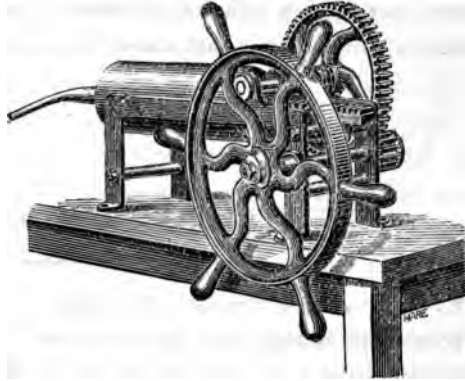


and will feed well for 14 to 21 days. In winter you can keep them for a month or more in the coops, if you want them very fat. In summer they will not stand confinement so long. I also give an illustration of another pattern coop, made rather differently, as 4 or 5

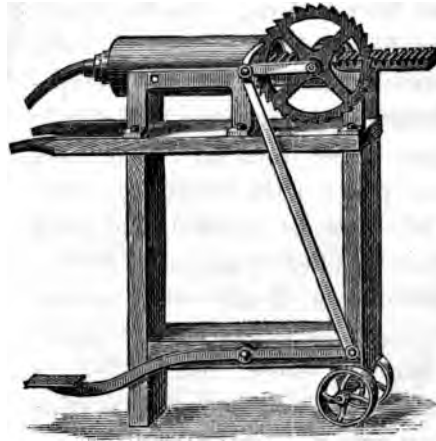
birds go in each of the two compartments. This is not so effective in action, but costs less. It answers every purpose for ducks, but chickens want separate compartments, if they are to fatten quickly.

Cramming Poultry is the next step to the fattening coops, and generally goes hand in hand with them. Several French cramming machines exist, the best of which is that of Messrs. Roullier, but in all of them is the fatal defect, that they are only available for liquid

food. Here is a sketch of an English-made Crammer, which is sufficiently powerful to feed with almost dry food. It is easy of management; working with a wheel which forces a plunger down the cylinder and out at the metal mouth into a rubber tube passed down the mouth of the bird to be crammed. Since this description was written a later improvement



has been added to the Cramming Machine, which almost explains itself in the woodcut. The improvement consists in doing away with the fly wheel in favour of a treadle, by which the one person holding the bird is enabled with his foot to set the Crammer in action. It saves the employment of a boy to turn the wheel. The people who use these machines live mostly in Sussex, and it is they who send the prime fowls to our London markets. They buy the birds unfattened in such



neighbourhoods as Hawkhurst, Dormer's Land, Burwash, and Horley. Every bird they send is killed and dressed by a professional hand, and they fetch top prices day after day. It is to enter into this high competition that every poultry breeder for market must try. A net return of 4s. per bird, money in three days, is not bad for September, but this is what a salesman in Leadenhall was paying one of his clients this year. Only send to market good young birds, plump and well dressed. Hens that have laid won't fetch much of a price, and had better be sold alive. The importance of well dressing poultry cannot be exaggerated, and is much overlooked. I know a very advanced and clever poultry breeder who sent birds up for sale with skins badly broken, and crops and gullets full of

the meal which had formed their last feed. Such poultry as this does not fetch a tithe of its value. Nobody but a higgler or small dealer would buy it, and unless killed fasting, birds very quickly turn

THE TELL-TALE EGG-TESTER AND EGGS.

EVERYONE well knows the disappointment arising from the number of infertile eggs found in many sittings, and the constant difficulty experienced in obtaining eggs that can be relied on. The Egg-tester supplied with Incubators will, however, enable the most inexperienced person to detect the infertile eggs, a few days after they have been placed in the Hydro-Incubator. These can be rejected, and their place supplied by others. The non-fertile eggs, if allowed to remain amongst the others, become putrid, eventually burst, and there is a great risk of the whole sitting becoming spoilt through these one or two bad eggs, but provided with a "Tell-tale" Egg-tester, this difficulty disappears.



Fig. 1.



Fig. 2.

Fig. 1 shows this useful little machine, with an egg as it appears five days after incubation, with its embryo chicken. In a darkened room the effect is more marked, and the disc must be held up between the eye and a strong light. It is easy to detect those eggs which ought not to remain in the Incubator.

Fig. 2 represents a clear or non-fertile egg 5 days after incubation. The round, opaque mass which shifts with every movement of the hand is the yolk of the egg.

Fig. 3 shows a fertile egg after five days' incubation. The yolk is expanded, and shews a semi-circle, darkening towards its base. The embryo is already formed, as may be seen by the blood red streaks converging towards it, and if it is vigorous, it should incline from right to left each time the egg is moved. If, however, it is dead, the red veins are dull and scarcely apparent, and the embryo seems fixed to the shell, and does not move. It looks as though it were a blot of ink in the egg.

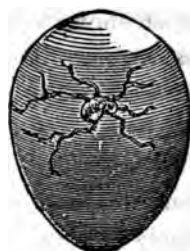


Fig. 3.

Fig. 4 represents an egg after being eight days subjected to the action of heat. It is the same as on the sixth day, but with the distinguishing marks more pronounced. The air chamber is also a little larger.

Fig. 5 shows a double-yolked egg, of eight days' incubation. These eggs are usually non-fertile, but even if good, and the incubation progresses favourably, one of the chicks generally dies, and putrifying, kills the second. Instances have been known of both hatching-out and doing well.



Fig. 4.



Fig. 5.



Fig. 6.



Fig. 7.

Fig. 6 is the egg fifteen days after incubation, when it has become nearly black. The air-chamber is enlarged, and at the top nothing but a few veins can be seen.

Fig. 7 shows the egg ready to hatch on the twenty-first day. It should be completely black, the air-chamber occupying nearly one-third of the egg, and in it may be seen the head of a chick, as it moves about, in its efforts to break the shell.

Fig. 8 represents a spoilt or "addled egg," which instead of appearing something like a



Fig. 8.

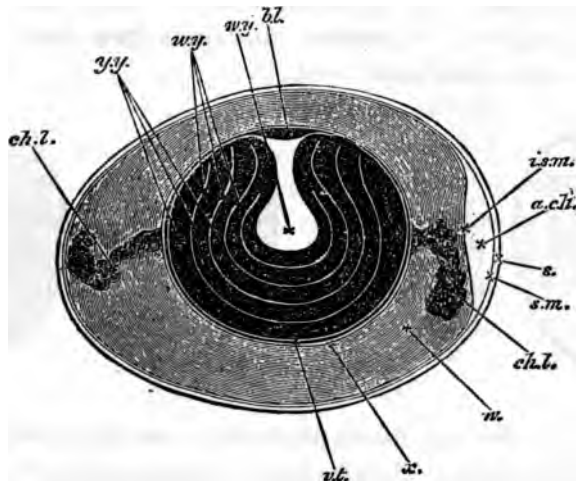
spider, shows a circle, or part of a circle, blood red, and more or less regular. Generally speaking, nothing appears in the centre, but occasionally some black spots may be observed.

Better still than being able to detect the infertility of eggs is the lessening the infertility itself. Food, and protection of fowls from wet and cold, are as necessary to this end as an adequate supply of male birds. In winter it becomes necessary to add extra nutriment to the food of fowls, and meat boiled down with plenty of green food will make an immense difference in the number of eggs, and not less in their fertility.

EGGS FOR SITTING.

Both hens and Incubators often get blamed for bad results of sittings which are purely to be attributed to either the staleness or

FIG. 1.



DIAGRAMMATIC SECTION OF AN UNINCUBATED FOWL'S Egg
(modified from Allen Thomson).

- bl. blastoderm. w. y. white yolk. This consists of a central flask-shaped mass and a number of layers concentrically arranged around this. y. y. yellow yolk. v. t. vitelline membrane. a. l. layer of more fluid albumen immediately surrounding the yolk. d. a. albumen consisting of alternate denser and more fluid layers. ch. l. chalaza. a. ch. air-chamber at the broad end of the egg. This chamber is merely a space left between the two layers of the shell-membrane. i. s. m. internal layer of shell-membrane. s. m. external layer of shell-membrane. s. shell.

some other fault in the eggs. A few *hints on Eggs* may, therefore, not be unacceptable. First, as regards freshness. Whenever it is

possible, use eggs taken direct from the nest to the Hydro-Incubator, but it is hardly ever worth while setting eggs more than three weeks old in winter or two weeks in summer. Older than this the chicks, if they hatch at all, are generally weakly, and rarely live. A fresh egg has a scarcely-perceptible air-space, but every day this space increases, so that, carefully "candled" with the "Tell-Tale," the air-space will show which eggs to set and which to utilise as food. The external layer of shell membrane dries harder and toughens each day the egg is kept, hence the importance of fresh eggs.

The following points cannot be too rigidly observed. Avoid VERY LARGE eggs, as also VERY SMALL ones, or those of an irregular shape. A hen's first egg is always clear. The egg-shell should be SMOOTH, and not ribbed, and perfectly free from SPOTS. The small coloured marks on an egg (sometimes seen) show that the shell is thin in places, and through these thin parts the air acts more readily, and dries the liquid portion of the egg, and the embryo chick dies before the 17th or 18th day. Fresh eggs will generally travel without endangering their vitality, but as their age increases, the risk becomes greater, by reason of the enlarged air space allowing so much movement inside the shell, as to intermix the component parts of the egg. Fowls' eggs travel best, but goose or ducks' eggs run great risk, the yolk of these latter breaking and, mixing with the albuminous parts much more readily than in hens eggs. The eggs of hens take 21 days to hatch (often less when quite fresh); partridges', 22 days; pheasants', from 24 to 28 days; ducks', turkeys', and goose eggs, 28 to 30 days.

Clear eggs, even after six or seven days' incubation, may be used for household purposes, or given as food to the fowls. A certain risk is always run in buying eggs for incubation from villagers and strangers, but a stipulation of "not more than three days' old" should always be made when eggs are wanted for sitting purposes, and they should be marked.

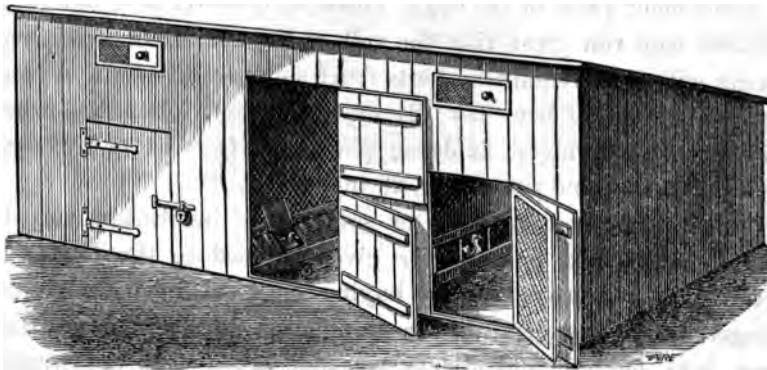
POULTRY HOUSES.

Extract *Live Stock Journal*, April 29th, 1881 (page 396).

"A poultry cart or 'follow the plough' poultry house, made to move about on large wheels from field to field, drawn by pony or donkey, or even by hand. It is made light, but durable, and supplied either painted or varnished. Where a low price is essential, the wheels may be omitted, and

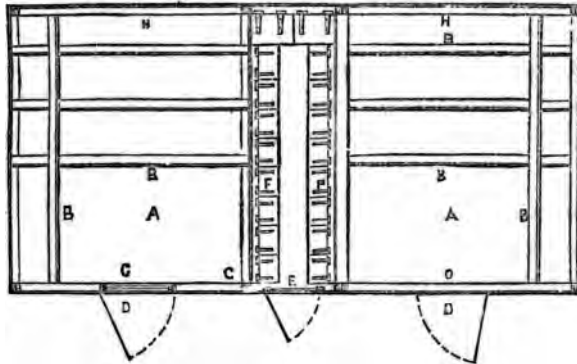


the house put on four legs, and fitted at each end with handles, enabling two men to comfortably move it about from place to place. The perches and nest boxes are all fitted ready to hand. The eggs are collected from the latter through the side of the cart. It is a neat and cheap portable poultry house, manufactured by Messrs. THOS. CHRISTY & Co., Fenchurch Street, of Hydro-Incubator fame."



Plans innumerable exist for Poultry Houses, and I am going to add one more to the number of them, but I think the sketch herewith shews a double house on a plan which gives the maximum of advantages at a minimum cost. There is a wide passage down the centre, dividing the two houses, and in this passage are the nest boxes, with tops lifting up, so as to enable the attendant to collect the eggs without interfering at all with the fowls. At the

end of the passage are two corn bins, very useful, and the two inside walls are formed of wire netting for this object. If eggs are wanted in winter, a certain warmth must exist in the fowl house. A Circulating Boiler, heated by a small lamp, does this quite well. All you want is to thoroughly keep out the frost, or to prevent the temperature from falling below say 40° . Of course forcing the house up to 60° or 70° would not do at all, but a house where it freezes every night will not fail to decrease the egg production. On wet days the fowls can be kept in their houses, the wooden doors being turned back and the wire doors provided for that purpose closed, allowing them air and light, but preventing their egress. The size in which these houses are usually made is 20 ft. long by 10 ft., with a height of 8 ft. in front. The ground plan and explanatory notes will show exactly the internal arrangements.



A, inside of houses; B, perches made removable; C, wire netting partitions; D, doors opening out from houses; E, door of passage; F, nest boxes, allowing eggs to be collected from the passage; G, wire doors, to shut in fowls when required, allowing air and light to enter; H, back of houses, with food lockers in passage.

COMMERCIAL INCUBATOR WORKING.

Some time ago I had occasion in a letter I wrote to *The Live Stock Journal* on the above subject, to give as my opinion that lamp-worked incubators could never answer "commercially," for that if hatching machines for some thousands of eggs were required, the expense and trouble of lamps would preclude all idea of a commercial success. Other correspondents differed from me, but I have since gone more thoroughly into the question, and wish to put before my readers, more fully than I could then, my plans of an incubator room, and how to arrange for the working power.

The building should be a long and rather narrow form of house, built of brick, and with either a brick or concrete floor. Divide off at one end 15 or 20 feet for boiler house, leaving a door of communication with the main incubator room. In the boiler house should be a small vertical two-horse power boiler; dimensions, 2 ft, diameter, 4 ft. 6 in. height, and alongside it a small feed pump. A pipe is carried out from the upper part of the boiler to convey the boiling water along the sides of the incubator room, taps being fixed at regular intervals throughout its length. The boiling water can be drawn off as required through rubber tubing direct into each incubator. The supply is unlimited, for as long as the clock-face indicator on the boiler shews even 1 lb. of steam pressure, you can keep on running off the water boiling, while the boiler itself is replenished by the feed pump from a tank in the engine room, covered with an iron grating. To get up steam requires, say 20 minutes, and the rest of the work can be done as quickly as the pipes will run off the water.

One word as to the incubator room. I have said this is rather long and narrow, and I prefer this shape because of having two rows of incubators, one down each wall—of course not touching it. The pipes for conveyance of the boiling water are fixed to the walls. The floor of the room slopes very slightly towards the centre, where there is a deep concrete gutter, say 9 in. wide by 6 in. deep. When the incubators require attention, the man goes round, takes the temperatures, and removes the egg drawers, placing them on top of the incubators. He should stick a pin in the woodwork of the water gauge, as a guide how much water he means to draw off. He leaves the taps running, the water flowing down the gutter to the tank in the boiler house. The taps turned off, it is time to put back the egg drawers, or he can begin filling up the incubator cisterns first, by opening the valve, allowing the water to flow along the incubator supply pipe. The feed pump is of course set going directly you draw off water from the boiler.

Now for cost. The incubator room and boiler house depend entirely upon their proportions. The cost of the boiler and feed pump, with all fittings, *new*, would be £22 10s.; piping, 2½d per foot; cocks for piping, 4s. each. For incubators up to 3000 egg capacity the furnace of boiler would be required about 4 hours out of every 24. For the remaining time you have a two-horse power boiler available for driving an engine for crushing bones, or any purpose.

POULTRY FOR PROFIT.

BY LEWIS WRIGHT.

In keeping poultry for market purposes, attention should be systematically directed to a few main points, according to the purpose in view.

EGGS.—To make a profit from eggs, we must procure, (1) Plenty of them, and (2) A good proportion when they are worth most—that is, in winter. The first object must be secured by a “good laying stock.” Now, certain breeds are, on the average, better layers than others. Such are Houdans, Spanish, Minorcas, Andalusians, Leg-horns, and many Hamburg cross-breeds (some Hamburgs lay very freely, but the eggs are too small to be liked). But all the pure breeds have been so much altered in their qualities by breeding, irrespective of laying, for feather points, that the laying powers of any *actual* fowls now depend more upon the family or strain of birds, than upon the breed, and it is particularly difficult to get in England good laying strains of Houdans now. This is a pity, as the Houdan is the best table fowl of the laying breeds; and this breed, on an average, can be best imported. But in any case, the only way is, to purchase the best obtainable upon reliable testimony of the laying qualities. Some expectations are sure to be disappointed; but probably some really good layers will be obtained, and then, as the quality is hereditary, like milking in cows, it can be developed, and good layers secured, by breeding from the *best layers only*, and using sires also solely from good laying families. There is no other sure way.

Laying in winter can only be secured by *hatching early*. Some advisers have ridiculously overdone this, and recommended January chickens. Such would begin far too soon, and in most cases moult, and stop laying in late autumn. Late in February, and through March, is the time to hatch for winter layers. Where, however, regular market supply is necessary, later birds must also be hatched to lay in spring and summer, when the winter layers will have exhausted themselves.

In all cases, fowls very rarely pay as layers after 2½ years, and should be killed before that. Should any hen, however, be an extraordinary layer, it may be good policy, for reasons already given, to *breed* from her as long as she retains real vigour.

When eggs are the chief object, hard grain, rather than soft meal, should be the main food.

TABLE FOWLS.—Where these are the main object, the choice of breeds will, as a rule, be very different, Houdans alone really supplying both objects in pure breeds, though many crosses answer well. Dorkings and Dorking crosses, and especially Dorking-Houdans, mature very early, and some *cross* or other has the great advantages of being much more hardy in chickenhood, and hatching stronger.

These points are of great importance, because to make chickens pay also, the best prices of the year can only be got by *hatching early*. For this purpose we want earlier than the other, and December, for "Spring chickens," is not too soon to begin. The great value of incubators lies in the certainty with which such plans of procedure can be laid down and adhered to, and the chickens hatched as required. It is in these early broods, and in the incubator hatching, that the proverbial vigour and hardiness of cross-breeds will be found so especially valuable. The management of the incubator will be discussed further on, but this point is of special importance. There are several pure breeds whose table quality cannot be improved by any crossing. But since *as good* fowls can be reared from crosses, and such hatch better and with less attention in the incubator, usually are ready a fortnight earlier, and are very much hardier, a judicious use of crosses has a special bearing upon those *early* chickens which make the best returns. At one time, in the early spring, fine specimens will realise four guineas per dozen.

DRESSING CHICKENS.—The price will, however, greatly depend upon attractive "dressing" for market; and this is a point in which English poultry-keepers are especially deficient. We have known one man express satisfaction at the prices realised by his consignment, while another was expressing his disgust at the "wretched return" (in one case we distinctly remember, it was 1s 6d per bird less than another consignor) the same day; the difference being almost entirely due to the "get-up." A good dresser can make a very inferior bird look almost as respectable as *some* people can make really fine fowls. A few good practical lessons, to anyone going into the poultry market to any extent, would be well worth their cost. There are some good dressers, even in England, from whom such lessons can be obtained.

Feathers, offal, and manure are all worth money ; and a farmer at least should credit their fair value to his own ground.

FEEDING.—Chickens for table should simply be forced on as fast as possible, which is done by an occasional judicious change, so as to preserve appetite. The last week or two a little condiment will help to keep up appetite if they are not to be penned up ; and some “ kindly feeders ” we have known, made at full range as fine and plump fowls as we wish to see. But condiments will not do for *more* than the last fortnight or so, and such as are to be penned should have none. Directions for these are given in subsequent pages.

But chickens meant for layers, or breeding stock, are better treated differently, and on a sparer regimen. The effects of forcing appetite generation after generation, in order to increase size in exhibition specimens of poultry, is seen at the present day in a most extraordinary increase of liver disease ; and the same effects will follow continuous forcing for any purpose. It does not matter for chickens meant to be killed ; nay, the tender flesh and tendency to fat which make a fowl or animal fit for table, are *not* perfect health by any means. Stock or laying fowls, therefore, should be fed amply, but plainly and moderately, the essentials here being health and vigour. A little meat and cayenne stimulate laying, but in some strains are very apt to produce soft eggs.

Soft food tends to fat—grain more to eggs, and to harder flesh. Even laying stock should have some soft food in the morning, and the preponderance of grain can be secured by mixing some grain in it, and feeding hard grain at night. Laying and breeding fowls should be thoroughly well and regularly fed, but still so that even at the end of a meal they are eager for food, and ready to run for a few grains a good distance. A fowl that once begins to “ pick over ” food has had a great deal too much, unless it is very ill.

All food should be bought in sufficiently large quantities to get it at only a fraction over Mark Lane prices, but of the best. Maize is a cheap food, but only suitable for light and active laying breeds ; in the heavier ones it tends to coarse, yellow, and internal fat—indeed, it has more or less tendency that way with all. Bran is all but useless as food, and singularly apt to cause inflammatory diseases of the bowels.

ILLNESS.—With fowls kept for profit, it is almost invariably the cheapest and best plan to put an ailing bird by itself in a com-

fortable and warm pen for one day, or at most two; and if not then better, to kill it at once.

Nothing is said here about the details of cleanliness or good housing. These are of course necessary. The object of these remarks has been to compress into a very small compass, and thereby to keep in the memory, the essential points of management to be systematically looked after in keeping poultry for profit.

TABLE FOWLS.

By T. CHRISTY.

GENERAL HINTS. COURTES PATTES. LA BRESSE. HOUDANS.
LA FLECHE. COUCOUS DE MALINES.

In many parts of England exhibitions have been instituted for table poultry, and also for dead poultry, but the late experience of the Dairy Show, when the Lord Mayor's prize of £10 was awarded to the worst pen of birds exhibited, shews that the present arrangements are far from satisfactory, and that much still remains to be done before the caterers of the public can be compelled to seek a breed of fowls that will give first-class *meat*; or, on the other hand, if, as some people assert, that breeds and crosses are now satisfactory, then it will devolve upon the Feeders to prove that they are producing the *highest quality* of meat. As it is not the inventor or the discoverer of a new object who fills the most important position in society, as he who turns existing principles and objects to the best account—so it is with poultry. The old monks and priests used to depend very much upon poultry and game for their food, with only the change of fish taken from their ponds and rivers. I am much interested in reading their ideas of what the meat on a fowl should be. For the upper table they selected a pullet or a young cockerel that had never been forced to go any distance in search of food; they selected birds that gave a great width of white flesh on the breast, as well as having meaty backs. The Dorking is hardly mentioned, but in France, where the highest class of food was sought for, the "Poulet de la Reine," or Courtes Pattes seem to have taken the first rank. Next to this the La Bresse, and then the Houdans; the La Flèche were noted for their fine eggs, and, when kept warm, for yielding a supply of eggs during the winter months. The Houdans are spoken of as very hardy birds, laying fine eggs.

Now as this brochure is written more especially for the breeders in the United Kingdom, common sense must be brought to bear in the direction of not only finding the fowl that will yield the best meat on its breast, but in searching for the breed that will withstand our inclement weather. There is no question that Mr. Lewis Wright's doubts about the La Bresse being too delicate to withstand a damp position, were well founded, for I have tried them in Essex upon light gravelly soil, where they did remarkably well, then in Kent upon clay, where they have not done so well, but this fowl will support a certain amount of confinement in pens, and the eggs are very fine.

For India, no breed could be better. The bird has sufficient game-blood in it to protect itself from the attacks of many animals, and they like to roost in trees. The Houdan, if bred with short legs and large frame, yields a fine meat, and is a prolific layer. The La Flèche attains a much greater weight, has darker flesh, and would do better in the South of England on light sandy soil, or in our warm Colonies. I regret that, although several people are breeding the crosses between the before mentioned fowls, with the Dorking and also the Crève with a Brahma, I am not able to give any reliable data as to which class of bird *yields the best meat*, but before another edition is in the press I feel confidence in asserting, from what I know some noblemen and gentlemen with large estates are doing in regard to poultry, that this question will be much better understood. The *Coucou de Malines*, which is no doubt a Belgian cross, has proved with me this year a bird much given to going broody; it makes a capital mother, lays a small egg, is sometimes found with feathered legs, and sometimes without. I allude to this, because one of the poultry writers ridicules the idea of any fowl for the table having feathers on the legs. For the table I prefer this breed to almost any French breed, taking into account its being raised in this country, it is so hardy, and comes into size so rapidly.

I beg breeders of poultry to SEND ME the particulars of cross-bred fowls, giving me the facts as to how they rear, the sort of eggs they lay, the quantity, and also one of the most important things is the weight to which they attain, and the quality of the flesh. At the same time they should distinctly state the parentage of each breed. For instance, if it is a cock of the Houdan breed crossed

with the hen of the Dorking, or if it is a cock of the Dorking crossed with the hen of the Houdan, because it is well known that a great difference results; again, they should also be most particular in stating the age of the parent birds.

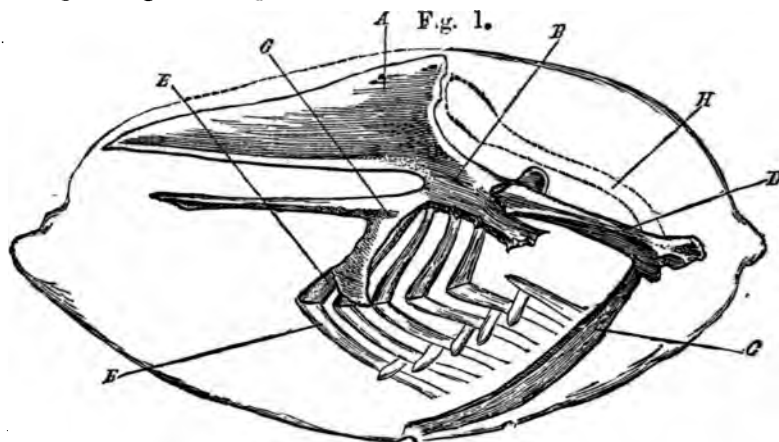


FIG. 1 shows a fowl with perfect or unbroken keel, dressed in the French style, but with E and F, the upper and the lower ribs, bent together, thus producing the same effect as far as appearance goes, but without interfering with the carving of the fowl and producing a much more meaty breast.

A, Keel; B, body of breastbone; C, bladebone; D, crossbone; E, lower ribs; F, upper ribs; G, side of breastbone; H, merrythought.

KILLING AND DRESSING.

As it is important we should keep well to the front, the reasons why I advocate the dressing of poultry by pressing down the ribs and not crushing the keel of the breast-bone, I have re-inserted the plates, so carefully drawn by Professor Parker, F.R.S. One can find out a lot of reasons for doing work in practice. For instance: Madame Aillerot shewed us how she always pressed the fowl with her hand on the breast, as soon as the life was out of its body; she stated it was to break down the ribs; no doubt it was, and it had the desired effect, but if anyone will take a fowl that has been properly fasted, and press it down directly the blood is out of its body, it will not return to its normal shape; take another fowl killed under the same conditions, and press that on its breast six hours after it has been killed, and you will find a volume of stinking gas come from its body: this, to my mind, is one of the reasons why the French fowls keep fresh much longer than English-killed birds. Thomas Bishop tells me, in dressing poultry for the English market, they have to be most particular to crush well the keel of

the breast-bone, but not to break the ribs for fear of decreasing the appearance of size in the fowl.

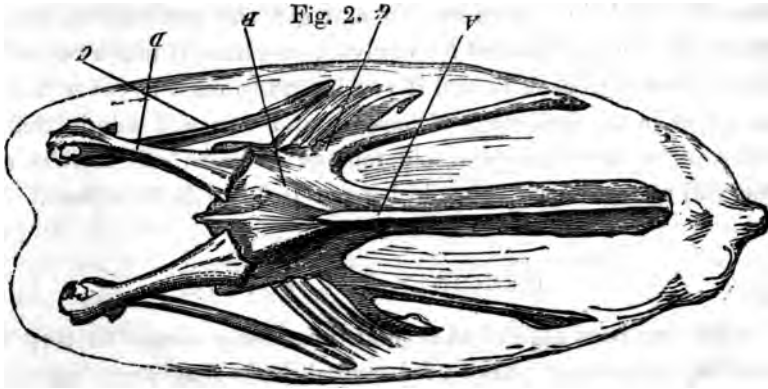


FIG. 2.—The same French-dressed fowl, showing a much broader surface of flesh.
A, Keel; B, body of breastbone; C, bladebone; D, crossbone; G, side of breastbone.

Some of the French dealers have been over here to see how the fowls ought to be dressed for the English market, and poultry is now coming over, so that it is almost difficult to tell them, except when the case is opened you find every fowl packed back uppermost. Before these are offered to the shopkeepers, they have to be pulled and stretched down so that the breast can be examined.

Another test as to the merit of a fowl is to weigh it when you buy it *market dressed*, but with all its offal in, then *dress* it for table and weigh it again. After it is cooked and you carve it, take note of what is on the breast, and the quality of the meat. Next take note of the quality of the meat upon the legs, and come to some conclusion if the meat on the legs is brown and hard, or if it is so tender and juicy that you can eat it with as much pleasure as you can the meat off the breast. But to give the worst fowls every chance, I would suggest a hint to the cook. When you begin to roast a fowl, put a piece of white paper round it, so as to allow the heat to get into the body of the fowl before it burns the skin; take the paper off just before the fowl is in its third stage of cooking, and allow the fire to act upon the skin.

As in this book I have taken the liberty to depart from the strict line of "Hydro-Incubation," I may here advise my readers not to despise a hen of a year-and-half old or even two years. When she is fat, as she will be if properly kept in the spring when other poultry is scarce, have her killed and carefully plucked and dressed

ready for cooking, then get a few vine leaves if you have any, if not, a dry cabbage leaf, and surround the body of the fowl with this : wrap the whole in a clean napkin, and get the gardener to put it about a foot under ground for twelve hours, have it taken out when you are ready to cook it, and if you intend to roast it, cover it with the paper in the first stage of cooking, and you will admit that it will rank equal to four-year old mutton in taste and flavour, and you will not again sell your old hens at 1s 6d to 2s 3d a-piece.

MEDICINES FOR FOWLS.

Having been applied to several times for a recipe to stop the scouring in poultry, I have tried several drugs that were known to produce the desired effect on the human being, but I have found none equal to *Plantago Ispaghula*, a small seed which is inexpensive, and is easily given to the fowls by mixing it with their food if they will not eat it naturally. I have also found that Russian Comfrey, chopped up fine, when they will not eat it in the whole leaf, also has a good effect, but not so rapidly. The Russian Variety they much prefer to the others as it contains more Mucilage or Gum. I have the testimony of many farmers as to the cure of scouring in calves when they have used the Russian Variety of Comfrey. When at the Derby Show this year, one or two members of the Royal Agricultural Society told me of their experience with Comfrey, and that it had proved very disappointing to them. I begged them to investigate upon their return home where they had purchased their stock, and in every instance was it traced to a few dealers who advertised cheap Comfrey under the name of Prickly Comfrey. These plants they have ordered to be destroyed at once, and from evidence that I have placed before them by parties who have grown it for years, they are so pleased with the results they are laying down large portions of their farms in this variety of Comfrey to secure regular crops. It is well-known to all herbalists that the common Comfrey causes scouring in animals.


Chaulmugra Oil is an excellent remedy for several ailments of poultry. In the first stages of cough if a capsule or some of the oil is poured down their throat, it not only relieves the passages very rapidly, but it also causes the birds to have a great appetite, which enables them to shake off their sickness.

In using this oil some people may notice that the eggs are flavoured by it, but on the other hand great care should be taken by people not to eat the eggs of fowls that are roup and that have bad coughs; great care also should be taken that these eggs should be kept separate for fear of their becoming mixed up for sitting purposes.

For sprains or lumps on the joints of fowls, if Chaulmugra is rubbed in well with the finger a few times, the whole stiffness and the lumps will disappear. This oil has also proved remarkably efficacious with horses where the saddle has chafed the skin or a collar has wrung the shoulders. Should a horse meet with a violent accident out hunting and get badly bruised, if this oil is rubbed in on his return home after he has been cleaned, in all probability the horse will be quite right in a few days. This treatment equally applies to a rider that has had a bad fall. Many men who are a good deal in the hunting field keep a large bottle of Chaulmugra Oil for instant application when necessity arises. It is so well-known now from the services it has rendered to people suffering from Rheumatism, and the immense relief it has given, that this alone warrants it being tried with poultry and animals. If Chaulmugra is mixed with Menthol it will in a few minutes relieve the worst cases of Neuralgia and Sciatica, but this preparation is not so often required for birds as for the attendants, who are indefatigable in the winter and early months with their poultry, often get a chill running out to look after them, so it is well to know how to get instant relief from any Neuralgic pains they may take from exposure.

Gapes, which often causes a cough, is a disease that has bothered many people. I have tried a preparation of Pyroligneous acid, which I applied by pouring a small quantity out into a saucer and then with a broad feather passing it down the throat and under the tongue. This done once or twice entirely frees the fowl, and it can be turned into its run again. This same acid I have also used with great success by rubbing it on to the neck and crop of fowls that have had a hoarseness in their throat, which often happens if fowls are kept on a heavy soil. If a fowl does not respond to one or two of these recipes in a few days, it is quite best to adopt Mr. Lewis Wright's views, and kill it.

If a bird or an animal should get a bad tear in the skin, if some of this acid, slightly diluted in water, be at once rubbed on, it will



prevent any festering or inflammation. Another very curious property which this acid is asserted to possess is, should a mad dog bite a person, and actually break the skin, if this acid is rubbed in at once it destroys all venom from the dog. I have asked Mr. Pasteur to make some experiments for me with the actual venom obtained from a dog suffering from *Hydrophobia*, because it is well-known that not more than five per cent. of people bitten by a mad dog suffer from Hydrophobia, therefore to say this acid prevents Hydrophobia setting in, would not be correct until it has been properly tried upon some animal. This I could not do in this country, as we are not allowed by the *Vivisection Act of Parliament*.

Papaw, or the milk of the "*Carica Papaya*"—this may be used where the fowl has a thickening in the throat, by making some up into a ball and passing it down the throat: it is well-known that this will digest anything, but both in Germany and America it has been proved that when using it in cases of Dyptheria, that although it has removed the stoppage in the throat in from twenty to thirty minutes, it has also caused a most healthy action to be set up upon the skin of the throat, which causes the raw part to heal very rapidly. This Papaw will also remove any lodgment from the crop.

Sweet Pepper is much coming into favour, as it turns a canary from a pale yellow into a deep saffron. It also has a similar effect upon Pekin ducks if this pepper is mixed with some of their food.

Owing to the large supplies coming here, it is now within the reach of anyone.

BRAHMAS AND BRAHMA CROSSES.

By ALEXR. COMYNS.

Poultry keeping has come to be regarded from two widely-different, and to a certain extent, antagonistic, points of view. The fancier sets up an ideal standard of perfection, and devotes all his efforts to producing specimens which attain, or at all events approximate to, that standard. The coveted type may be one which has not beauty, in the ordinary acceptation of the term, to recommend it; the outside world may see in the much lauded prize specimen only an ungainly monster; still the beauty, to the fancier's eye, may be found in the very points which, to other eyes, constitute ugliness. To do the fanciers justice, harmony of colour, symmetry

of form, and grace of carriage, are in most cases part of their standard, but it would be doing them more than justice to add that utility is much in their thoughts. It is utility that the keeper of farm poultry has in view. His standard is, or should be, one made up of table qualities, laying powers, and constitutional hardiness. He may attach more or less weight to table qualities or laying powers, according to circumstances, but both must always be kept in view.

It is with the Brahma, as a useful bird, that we have now to deal. When first introduced, the breed excelled in two at least of the points of utility which we have named. Brahmas were exceptionally good layers, both in summer and winter, and did not require any special local advantages of soil or space to bring out their powers. They were also hardy as old birds, and easily reared as chickens. As regards the third point—table qualities—they never had any special claim to pre-eminence. They then were, and still are, good birds for the family table, where the large proportion of meat on the legs is not objected to by those who know how good that meat is; but for the market the extra development of the legs, coupled with the yellowness of those members, constitutes a serious objection. On the other hand they then, as now, had within them potentialities of excellence as producers of table poultry. Pure Brahmas are not first-rate table fowls, but as forming one constituent of crosses for the production of large, well-proportioned, and delicately flavoured table fowls, nothing can surpass the Brahma.

Setting aside for the moment the consideration of table qualities, we return to laying and hardiness. How far has breeding for fancy points caused a deterioration as to these? As to laying, the evil has been great, especially in the dark variety. The struggle for superiority in pencilling and other points has been so keen that laying has necessarily become a very secondary consideration, and Brahmas are now, as a rule, indifferent layers. Hardiness has stood the test of severe competition better, but even here a special evil has become prominent. Liver disease is the worst enemy the Brahma fancier has to contend against. It is, however, chiefly the result of a long continued system of high feeding for early growth, and would not be likely to prove troublesome to the keeper of farm poultry.

The best method of recovering the laying qualities of the breed, and getting rid of the troublesome tendency to liver disease to which we have referred, would be to obtain birds of fairly good laying strains

from various parts of the country, or from this country and America, and to cross the different strains with each other. A few seasons of selection for laying qualities, with a judicious use of fresh blood, would doubtless soon lead to the recovery of the lost merits. One lady of our acquaintance adopted with advantage the plan of crossing the dark with the light variety, producing in this way extra large birds of a mixed grey colour, which were excellent layers. The birds of this cross were not very beautiful, but the breeder of farm poultry must learn to make mere beauty a secondary consideration.

As table qualities must not be forgotten, even when laying is of primary importance, it will be well to make shortness of leg, size and squareness of frame, considerations in the selection of the useful Brahmas. Again, some strains frequently throw birds with white, or nearly white, legs, and—other points being equal—a preference should be given to these.

If the production of good table fowl is to play any important part in the business of the poultry farmer, the Brahma as a pure breed must be rejected, except in so far as is necessary to keep up the stock for crossing with other breeds. We may even go further, and say that for all purposes of utility Brahma crosses will be found to surpass pure Brahmas. Size has generally been regarded as a most important point by Brahma fanciers, and cocks of the breed weighing thirteen pounds are by no means uncommon. The hens also attain very great weights. The Cochins alone can rival the Brahma in weight, and as the Brahma has a much fuller breast than the Cochins, and is white in skin, while the Cochins are generally yellow, its superiority as a cross for table purposes is undoubted.

As the female parent has been found to have the greater influence upon the size of the progeny, the Brahma hen crossed with a cock of the other breed will in general give the best results. We say in general, because the plumpest, whitest-fleshed, smallest-boned table fowls we have ever seen were the result of a cross between a dark Brahma cock and a Houdan hen. The hen was an exceptionally large one, and very squarely built. If such Houdan hens can be obtained, cross them with a Brahma cock by all means, but in the case of crosses with Houdans, or even with Dorkings of average size, it is *best* to use Brahma hens, while in the case of crosses with the smaller birds, such as Leghorns, Minorcas, and Spanish, the use of hens of the large breed is imperative.

The Brahma crosses of which we have had experience are Dorking - Brahma, Houdan - Brahma, Brahma-Houdan, Spanish-Brahma, Minorca-Brahma, and Leghorn-Brahma, and we have in all cases used dark Brahmas. The lights produce equally good results, but the colours of the progeny are generally less pleasing to the eye.


As to Dorking-Brahmas, we have found that a much more uniform result was obtained by using silver grey Dorkings rather than the coloured variety. The produce of this cross resemble the silver grey Dorking in plumage, and are handsome birds. Like all the Brahma crosses, they are exceptionally hardy, grow rapidly, feather early and easily, and are good layers all the year round. They also make very good table fowls of great size.

The Houdan-Brahmas possess similar qualities to the Dorking-Brahmas, but are not quite so large. The pullets are black, with small crests. The cockerels are mixed in colour, some coming black and white only, and some having a golden tinge in the hackles. Of the Brahma-Houdans, a cross between a Brahma cock and Houdan hen, we have already spoken.

The brown Leghorn-Brahmas are, as might be expected, not so large as either of the two previous crosses. The pullets are of a rich partridge colour, sometimes pencilled and sometimes plain feathered. They are exceptionally good layers. The cockerels are somewhat uncertain in colour. This cross makes a better table fowl than might be expected, the chickens being plump, fairly white in skin, and only tinged with yellow on the legs.

The Spanish-Brahmas and Minorca-Brahmas are of very similar types. The pullets are uniformly black in plumage, with white ear lobes; the cockerels sometimes quite black, sometimes with gold in hackles. The birds of these crosses are extra good layers, and lay very early, make very good table fowls, and are larger than the Leghorn-Brahmas, to which we prefer them.

As a general rule it is not advisable to breed from cross-bred birds, but this rule has exceptions. In the yard of a friend, who has had much experience in farm poultry, we saw recently some very fine pullets bred from a Dorking cock mated with Houdan-Brahma pullets. The reason for employing this cross upon a cross was to be found in the fact that, the cross-bred pullets laying earlier in the year than pure bred ones, chickens of this Dorking-Houdan-Brahma variety could be hatched at a time when no others were to



be had. They have, so far, turned out a success as layers, and the cockerels make good table fowl.

Creve Coeurs and La Fleche are said to cross admirably with Brahmas for table purposes, but can hardly be said to have become sufficiently acclimatised as yet in this country to be generally used for such a purpose. Courtes Pattes would seem to be specially fitted for a Brahma cross, as their preternaturally short legs and plump bodies would counteract the tendency to length of leg in the Brahma. Scotch Greys and Dumpies also seem to offer advantages for crossing with Brahmas, but as we have never tried or seen the produce of either of these crosses, we can only suggest them as being likely to be successful.

In all Brahma crosses, the points already referred to, namely, shortness of leg, size and squareness of body, and if possible, whiteness of leg, are of primary importance on the Brahma side, while good laying qualities, and such table qualities as are to be had in the other breed used in the cross, are not to be lost sight of.

POULTRY ON THE CONTINENT

BY JAS. LONG.

The system under which poultry is bred, fattened, and sold in France has been frequently described, and indeed, I am under the impression that it has not been referred to too often, because we have a great deal to learn from the French, and because they, more than any other European nation, afford us the means of obtaining knowledge of a subject which is continually changing, and advancing, and which, in their hands, as in our own, is assuming a most prominent position. I do not here profess to deal with French poultry at all, but a few words may perhaps be said with advantage *en passant*, as the reader is taken to the poultry yard of a sister country. The Calais market, like that at Dieppe, quickly shows an Englishman how different is the system pursued, and the long rows of Turkey-poults—tied by the heels, and laid alive on the stones, remind us that the French do not wait until Christmas before they kill them—age would appear to be no consideration, for close by are country women with their baskets of late hatched chickens, (the month is September) the majority of which are no larger than good

sized Pigeons. Of the Parisian markets, and the large Parisian dealers who supply any species of fancy poultry, and who consider their birds the finest in the world, nothing need be said. The markets now-a-days are very seldom worth a visit, for a really good specimen is a rarity, and the dealers—well, they are ignorant of their trade, while possessing as large an amount of assurance as I have ever seen in mortal man. There is one highly respectable man who has started in a suburb of Paris as a dealer, who is not a Parisian, nor indeed a Frenchman, and his verdict upon the French poultry breeder and fancier is very severe. He declares them to be not only ignorant, but wanting in the common knowledge of their business, contemptibly mean, and conceited in the highest degree. He says that they do not commence to breed until the early English breeders have finished, that they will not admit the advantages of early hatching, and that they persist in maintaining the superiority of their birds over the English, and those of every other nation. To prove how wrong they are, even with their own native breeds, he told me that for their best shows he imported Houdans and Crèves from England, and these he sold for exhibition, because he could not get them so fine in France. The English breeder, said he, has a purpose, the French has none. Again, it is clear that the French breeder cannot excel in any of the prominent races, because he will not give the price. 8 to 10 francs a head for stock birds he considers a large sum, and more you can seldom induce him to give; at the same time he fully understands how to ask an Englishman ten times the amount for the most ordinary specimens.

Let me however get to Switzerland. I cannot attempt to describe any system peculiar to the Swiss, because I do not believe they have yet reached that point of civilization where poultry is taken any account of in national economy. The Swiss are not a poultry keeping nation, and very few fowls are seen in the country, nor have I ever seen an egg on a Swiss breakfast table, in fact, if there is one thing which one misses in any form, it is the egg. An enquiry in a country village taught me that the price of an egg was twopence, which is some guide to the supply, inasmuch as new-milk was sold in the same locality at one penny the litre (nearly a quart). Without doubt, one of the great causes of such a state of things is, that corn is little grown, and is very expensive to buy. It may then be taken for granted that in Switzerland eggs and


chickens are dear, and that the industry is consequently one, which will pay to open up and cultivate.

When there is the slightest chance of obtaining good results from the expenditure of energy, ingenuity, and money, it is generally found that Americans are among the first to break the ground, and so it is here. Switzerland evidently appeared to be a field particularly fitted for something in the poultry line, and so Mr. W. W. Page determined to establish a poultry farm with the sole object of supplying eggs and chickens to the markets of Zurich, and other large towns. The end of the year 1881 will probably find Mr. Page's arrangements complete, and a year hence, we shall perhaps know what his results have been. He determined to keep certain pure races, under the best conditions as to housing, warmth, and food, and to hatch entirely by artificial means. This in itself means considerable outlay, and what is even more, the exercise of a large amount of practical knowledge, for there are few men so insane as to spend thousands of pounds upon poultry, buildings, Incubators, &c., who are not tolerably good masters of their subject. Mr. Page's Incubator room is a large one, and may be called a hatching and rearing room. On one side the machines are ranged, and a visitor not conversant with the subject, might easily take them to be glass cases for the display of eggs. These machines are capable of hatching 3,000 chickens, and are provided with top and bottom heat, which is supplied by hot water. The top-heat is obtained from water-proof tubing, which lays at the row of eggs as they stand on little shelves, and the whole of the hot water circulates from a boiler at the back, which is heated by a furnace. Thus the whole range of Machines is practically one—they being all united by pipes, and all connected with the same boiler. Eggs did not fill them all at the time of my visit, but many were properly working, and some were actually hatching chickens.—Again, a large number of artificial mothers were connected with the same hot-water system; these being set down below and in front of the Incubators, their runs stretching right across the building, and the floors well covered with dry earth. These runs reminded me of the Duck runs at Dunstable, where there is a similar, but smaller building, filled with compartments for rearing young ducklings. How far Mr. Page will succeed in hatching and rearing in this building remains to be proved. There is one thing, he is not above

taking a lesson from any one, and with characteristic energy, he is certain to succeed in the long run.

The Poultry houses are equally practical and well made; the plan followed is something like that at the *Jardin d'Acclimatisation* at Paris, circular, although in Mr. Page's case the range of buildings form an entire circle, whereas those in the gardens are one half. In the centre of the circle is a grass plot with beds of fruit, tomatoes, and wall fruits, the range is well tiled throughout, and the walls covered with the wooden shingle used so much upon country houses in the Canton. Next the walls inside the building, a passage runs around the entire circle, from which each compartment is entered, and the eggs gathered. How many houses there are, I forget, but they are numerous, and each is provided with a nest box, the bottoms of the nests being barred so that the air can circulate. At the back of the nests a door opens into the passage so that the eggs can be taken without entering the house, over the nest boxes is the perch so arranged that the manure falls upon a plain ledge, which is fresh sanded daily. The compartments are large, being about 30 feet by 9 or 10, and they open into a shed which the fowls can use on the wet and windy days, when the open runs are no temptation to them, or are covered with snow. Each run accommodates about 30 birds, and is tolerably extensive, and, of course, well grassed.

The breeds Mr. Page has at present are light Brahmas, Plymouth Rocks, Houdans, and what he calls Italian Fowls. The light Brahmas, and there are numbers of them, are very good, and will no doubt pay their way well as layers; among them were several which were quite white, and which resembled Cochins more than Brahmas. The Houdans looked more fit for the show-pen than work, and their owner is not satisfied with their performance. Plymouth Rocks are becoming well-known to British readers, and Mr. Page has taken them upon trial, trusting more to the good report which is given of them by our people than anything else, and to begin well, he sent here for a number, for which he gave a guinea each for—a high price for mere layers. The Italian Fowls are Leghorns pure and simple, and Mr. Page is a great admirer of their qualities. He buys them cheaply enough in Northern Italy, and, although I noticed among them crested birds and fawns, the majority were what we in England would call standard colours, Whites, Browns, and Cuckoos; the food used is chiefly maize, which is



expensive. If such a farm can succeed in Switzerland, and I have no doubt it will, why should it not answer upon an English farm, where corn is grown at home? Our farmers complain of the times—they cannot rear cattle to profit on account of American competition; many farms will not carry sheep on account of the fluke—wheat, they tell us, does not pay to grow, but how many are there who have tried poultry: they keep a few common hens and sell the eggs at the nearest market in summer, when they are plentiful, and they get none in the winter, but they don't try to obtain them when they are of the most value: they hatch late in the first place, and in the second they adopt no system of housing, warming, or feeding in accordance with the weather, on the contrary, the birds get less food, and are made to wait many extra hours between night and morning. The same men would consider it madness to adopt such a system with their cows or their pigs.

After all, the business of poultry raising for market is in its infancy, but as artificial hatching becomes more known, and the value of pure breeds for crossing is understood, it will extend, and it is to be hoped that by degrees the thousands of pounds paid by us to France will be decreased, and circulated at home.



BROWN LEGHORNS.

By A. C. BRADBURY, Nuthall, near Nottingham.

My experience with the Leghorn fowl commenced about two years after their introduction into this country, and, jointly with my
[redacted] have bred them largely ever since. The number we have

reared must be some thousands ; and after long experience and close observation, both with imported and English bred stock, I can fully endorse all that has been said as to their hardiness and extraordinary laying qualities. They have made rapid progress since their introduction into this country, and bid fair to become, in a few years, one of the most popular breeds we have. They are such a thoroughly useful fowl in all respects that I have no hesitation in saying that of all the smaller breeds they are the most valuable. The Brown variety is perhaps the most useful for the majority of breeders. They are about the same size and are bred to the colour of black red game. Their eggs are also about the same size, perhaps larger, if anything, but in number they of course surpass game immeasurably. We have many pullets every year that commence laying at four months old, but this is earlier than the average for breeding them, as we do chiefly for showing, we like to keep back the laying until about six months old. Some years ago, when we kept them in smaller numbers, we registered the number of eggs, but it would be next to impossible to do so with the large number we keep now. We have many birds that ranged from 200 to 250 eggs per annum, and I am perfectly satisfied that if I were breeding for laying purposes only, I could by selection in breeding produce birds that would average year after year 200 eggs annually. My selection would be very simple. I should take a cockerel whose mother was my best laying hen (for internal characteristics are inherited more from the mother than the father), and mate him only with the very best layers, if I could only find two or three such, never mind, I should hatch as many chicks as were wanted, prove them, and follow up the same principle again the next season, choosing for breeding only three or four of the very best layers. Never be anxious to breed from a large number, for in doing so one cannot be sure of breeding *only* from the best ; of course birds of robust health must be chosen, whatever we are breeding for.

As to the hardiness of Leghorns, it is impossible to say too much in their praise ; if they have plenty of range they will look after themselves from a fortnight old. I have known them in a warm moist season be taken away foraging by the hen in the morning, and never come near the yard to be fed for days, and these make the big hardy chickens ; at six months old they will be nearly double the size of chickens the same age that have been fed in coops.

In winter many of them will prefer roosting outside to being in a warm shed, though let it be understood I do not consider this good for winter laying: I merely mention it as an illustration of their hardiness. I have known them through such intense winters as the last two or three, roost on the top of a wood pile, without a thing to cover them, the said wood pile being against a warm cow shed, which they had the choice of going into. Of course, during severe frosts the spikes of the combs would be frost-bitten and come off, but the constitution of the bird seemed to be none the worse. I am afraid to trespass further on your space, so in conclusion will only say that as a farmer's fowl nothing can beat the Leghorn, and I am sure after a season or two experience with them no one will regret having taken them up.

PLYMOUTH ROCKS.

By A. C. BRADBURY, Nuthall, near Nottingham.

This handsome fowl (a recent American introduction) resembles the Cochin in shape, but is rather more sprightly in carriage, with clean yellow legs; colour, grey or cuckoo. It is very hardy, an excellent table fowl, and much to our surprise, proves equal to the Leghorn for egg production, their eggs being the richest in flavour we have ever tasted, even superior to game. This breed, until last season, had to compete in that unsatisfactory "Any Variety Class" at shows; but the number of breeders having increased, this truly grand bird has now been included in the scope and operations of the Leghorn Club, with the view of obtaining separate classes for it, and so bringing it to the front as it deserves. Classes were given for it at several of the principal shows during the past season, and the way in which these classes were filled amply testifies that it has already a large number of admirers. It is certain to become very popular, from the fact of its productiveness, hardiness, and good table qualities; we have had cockerels at six months old weighing 18 pounds a pair; its color also is well adapted for wear, and though considered a sitter, it seldom incubates more than once in a season; indeed, we had one strain, the birds of which, during the two years we kept them pure, never incubated at all.

DORKINGS.

By MISS PASLEY, Moorhill, Shedfield, Botley, Hants.

Among the many breeds of useful poultry, the Dorking holds a prominent place, being undoubtedly one of the very best fowls for the table, and a good layer of large white eggs. There are four well-known varieties of Dorkings—the coloured or dark, the cuckoo, the silver grey, and the white. The first two named varieties are probably the best for farm poultry, on account of their great size and hardiness, but they all do well on dry and gravelly soil. It is unnecessary in this short notice to describe the different points of colour in each variety, but only to speak of those characteristics that should be kept in view in choosing stock birds of every variety of Dorkings, if the object be to have profitable poultry on a farm, and to rear chickens for the market that will pay well. The birds, then, of both sexes, should be large-framed square looking birds, broad backed, full chested, with long straight breast bones, large bright red combs and wattles, smooth glossy plumage, whatever the colour, short stout white legs and feet with five toes well separated, and spurs inside. It is very important that the feet should be well-made, as birds with bad feet often produce cripple-footed chicks that will not thrive. If healthy fowls, such as I have described, are chosen for stock, with moderate care and attention they are sure to do well. Dorkings are of a roving nature, and should have as much liberty as possible, and not be too crowded in their roosting places. The chickens are easily reared, and if well fed from the first are ready for the table at an early age. Cockerels should weigh without fattening 1 lb. for each month up to seven months old; but it is best to shut them up for ten days or a fortnight to fatten. I have never found it necessary to do so with pullets, which though smaller, have plenty of flesh on them when taken up from their runs without fattening. Full-grown cocks should weigh 11 or 12 lbs., and hens 9 lbs. I might say more in their favour, but this is, I hope, enough to show that thorough-bred Dorkings are profitable fowls for farmers to keep.

There are many useful crosses to be obtained by mating Dorkings with other fowls, but the only two crosses with other breeds that I can speak of from actual experience, are between Dorkings and Buff Cochins, and between Dorkings and Dark

Brahmas. In each case I mated a large Dorking cock with large and good hens and pullets, and from these reared a large number of the most healthy and fast growing chickens that could be wished for. I must give the preference to the Dorking and Cochin cross, as I found the chickens were sooner ready for table, the pullets laid sooner, and the birds of both sexes were singularly handsome; while the cockerels, at any rate from the other cross, were leggy and ugly. This is, of course, only a "fancy" point, but where nothing useful is lost by it, it is certainly much pleasanter to have beautiful fowls to look at than ugly ones. I must add, I found the hens from the Dorking and Cochin cross first-rate layers and excellent mothers.

From *Journal de l'Agriculture*, 1st October, 1881.

ARTICLE BY MONS. J. A. BARRAL,

Perpetual Secretary of the National Society of Agriculture of France.

Last spring, in company with Mr. Lemoine, I made various experiments regarding the food of fowls, basing them upon pens of Creve Coeur, La Fleche, Houdans, and Dorkings, the object being to determine the amount of matter containing nitrogen necessary to sustain them. The result proves to be, that they require more than is necessary to the larger domestic animals, but less than is necessary for birds living at liberty and making a great expenditure of their forces, or less than the amount required when in moult. Many circumstances, however, may tend to modify the rations, and all the conditions are not yet known.

The *Societe de l'Agriculture* received last January from M. Chatel, a note entitled "A Wood Pigeon's Dinner;" giving a list of food found within the crop of a pigeon shot at Valcongrain. Since then Mons. Chatel has sent the same information as to three other pigeons of the same kind. The analysis of the contents of the four crops, which contained, three of them leaves of rape, and the fourth grains of corn, gives the proportion of matter containing nitrogen as 0.432 gr., 0.683 gr., 0.413 gr., 0.532 gr., or an average of 0.515 gr.

We possessed already the knowledge of Mr. Baussingault's two experiments with a turtle dove of the weight of 187 grammes fed

on millet. We found in 24 hours the consumption of food was as follows:—

	Per head and per day.	Per kilo. of Live Weight, and per day.
Millet—ordinary state ...	16.75 grammes...	80.56 grammes
Do. dried	15.19 „	81.23 „
Water drank	6.38 „	34.11 „
Do. total consumed ...	7.94 „	39.44 „
Carbon	6.99 „	37.38 „
Nitrogen	0.50 „	2.67 „
Matter containing Nitrogen	5.13 „	17.64 „

It results from a comparison of these figures that with a greater weight of solid food the turtle dove consumed each day as nearly as possible the same amount of matter containing nitrogen as did the wood pigeon sent by M. Chatel.

I was anxious to extend my experiments to other animals, and as there did not exist any scientifically exact record of food consumed by fowls, I carried out the following experiments with the aid of Mr. E. Lemoine, breeder of domestic fowls, whose establishment is at Crosne. Separate pens, consisting of 1 cock and 3 hens Creve Coeurs, 1 cock and 4 hens La Fleche, 1 cock and 3 hens Houdans, 1 cock and 4 hens Dorkings, were placed in Mr. Lemoine's runs. Each day the food given and the food eaten was weighed, and the weight of each lot of fowls was carefully taken at the commencement and end of the experiments. The eggs laid were collected and weighed. Samples of the food were taken and analysed. The results were as follows:—

CREVE COEUR BREED.				Before the experiment.	After the experiment.
1 Cock, weighing	3.250 kilos.	3.400 kilos.
3 Hens, weighing together	7.500 „	7.950 „
Gross weight	10.750 kilos.	11.350 kilos.
Average weight	2.690 „	2.840 „
Food consumed.	Food in its natural state.			Food dry.	Nitrogen con- tained in food.
Seeds	1,785 gr.	33.56 gr.
Rice	700 „	4.97 „
Paste...	800 „	7.68 „
	3,285 gr.	46.21 gr.
Average per head and per day ...	136.8 „	95.6 „	1.93 „		
Average per kilo. and per day ...	49.5 „	34.6 „	0.699 „		

On this lot of fowls there was an increase in all of 600 grammes

live weight, say $5\frac{1}{2}$ per cent. during the experiment. There were besides laid 14 eggs, weighing 958 gr., an average of 68.5 gr. each.

LA FLECHE BREED.					Before the experiment.	After the experiment.	
1 Cock, weighing	...	...	...	...	3.75 kilos.	3.95 kilos.	
4 Hens, weighing together	...	...	...	...	8.85 ,,	8.95 ,,	
Weight of the lot					12.60 kilos.	12.90 kilos.	
Average weight per head					2.52 ,,	2.58 ,,	
Food consumed.					Ordinary state.	Dry state.	Nitrogen in food.
Grain	2,160 gr.	1,747 gr.	39.48 gr.
Rice	1,350 ,,	910 ,,	9.59 ,,
Paste	930 ,,	401 ,,	9.12 ,,
					4,400 gr.	3,058 gr.	58.19 gr.
Per head and per day					146.7 ,,	101.9 ,,	0.761 ,,
Per day and per kilo. of live weight					57.5 ,,	39.9 ,,	0.761 ,,

There was an increase of weight on this lot of 300 grammes, say $2\frac{1}{2}$ per cent. on the weight at the time the experiment commenced, seven eggs were laid, weighing together 426 grammes, or an average of 70.9 gr. each.

HOUDAN BREED.						Before the experiment.		After the experiment.					
1 Cock, weighing						2.60	kilos.	...	2.45	kilos.			
3 Hens, weighing together ...						7.50	„	...	7.51	„			
Gross weight						10.10	kilos.		9.96	kilos.			
Average weight per head						2.52	„		2.49	„			
Food consumed.						Ordinary State.		Dry state.		Nitrogen in food.			
Grain						1,250	gr.	...	1,040	gr.	...	22.50	gr.
Rice						1,200	„	...	809	„	...	8.52	„
Paste						800	„	...	338	„	...	7.68	„
Total for 6 days... ..						3,250	gr.	...	2,187	gr.	...	39.70	gr.
Say per head and per day ...						135.4	„	...	91.3	„	...	1.65	„
Per day and per kilo. of live weight						54.2	„	...	36.5	„	...	0.660,	

There was a diminution in the live weight of this pen of birds amounting to 140 grammes, equal to 0.7 per cent. of their weight at the commencement of the experiment. Only four eggs were laid, weighing together 276 grammes, or an average of 68.9 gr. each.

DORKING BREED.					Before the experiment.	After the experiment.
1 Cock, weighing	...	...	...	...	3.60 kilos.	3.90 kilos.
4 Hens, weighing	...	..	...	...	9.95 „	10.85 „
Gross weight	...	...	...	...	13.55 kilos.	14.75 kilos.
Average weight per head	.	2.71	„	...	2.95 „	

Food consumed.	Ordinary state.	Dry state.	Nitrogen in food.
Grain	1,975 gr.	1,643 gr.	37.13 gr.
Rice	1,100 „	742 „	7.81 „
Paste	1,400 „	591 „	13.44 „
	4,475 gr.	2,976 gr.	58.38 gr.
Per head and per day	186.4 „	124.0 „	2.43 „
Per day and per kilo. of live weight	65.2 „	43.8 „	0.894 „

There was an increase of weight upon this lot of 1200 grammes, equal to 9.7 per cent. of the weight at the commencement of the experiment. There were besides laid 21 eggs, weighing together 1310 grammes, or an average of 62.4 gr. each.

I ought to add that the grain given was a mixture in three equal parts of wheat, oats, and buckwheat. The rice was cooked. The paste was composed of half potatoes and half oatmeal and bran in equal proportions. These foods in their ordinary state contained per 100 parts:—

	Water.	Nitrogen.
Wheat	16.79	1.90
Oats	14.67	1.96
Buckwheat	18.94	1.77
Cooked Rice	32.59	0.71
Paste	57.76	0.96

It will be seen that the quantity of matter containing nitrogen consumed each day has equalled in nitrogen for these four experiments respectively, 1.93 gr., 1.94 gr., 1.95 gr., 2.43 gr. per head per day.

In the third experiment (Houdans) the amount of matter containing nitrogen was too small, and the birds accordingly grew thinner and laid fewer eggs. The ration was insufficient, not as regards the total weight given, but in nutritive power. It will be seen that the quantities of matter containing nitrogen consumed per

kilo of live weight are greater than those required by man and by domestic animals.

I have not yet experimented with geese or turkeys, or ducks. Those with cocks and hens also want to be completed by further remarks and experiments, especially as regards the moulting stage. The results obtained are identical with those found by Mr. Baussingault in his study of the food of the turtle dove. It may, therefore, be considered as proved that birds, weight for weight, consume generally more than mammals, and that birds which live in complete liberty and make a great expenditure of strength, consume more than others.

(Signed) J. A. BARRAL.

For the convenience of my readers I have tabulated the above statistics.

	Average weight per bird at commencement of the experiment.	Average weight per bird after the experiment.	Weight of Food consumed during the 6 days.			Per Head and per Day.			Per Kilo. of Live weight, and per Day.			Increase of weight in birds.	Decrease of weight in birds.		Eggs laid.	
			Natural state.	Dry state.	Amount nitrogen contained.	Natural state.	Dry state.	Nitrogen contained.	Natural state.	Dry state.	Percentage nitrogen		Total number.	Average weight.		
CRÈVE CŒURS— Cock, 3 Hens	Kilos. 2.690	Kilos. 2.840	Grms. 3,285	Grms. 2,295	Grms. 46.21	Grms. 136.8	Grms. 95.6	Grms. 1.93	Grms. 49.5	Grms. 34.6	Grms. 0.699	Grms. 600	—	14	68.5	Grms
LA FLÈCHE— Cock, 4 Hens	2.52	2.58	4,400	3,058	58.19	146.7	101.9	0.761	57.5	39.9	0.761	300	—	7	70.9	
HOUDANS— Cock, 3 Hens	2.52	2.49	3,250	2,187	39.70	135.4	91.3	1.65	54.2	36.5	0.660	—	140	4	68.9	
DORRING— Cock, 4 Hens	2.71	2.95	4,475	2,976	58.38	186.4	124.0	2.43	65.2	43.8	0.894	1200	—	21	62.4	

THE TOURNAMENT OF INCUBATORS.

Commenced at 6 a.m. Thursday, Sept. 5th, at Hemel Hempstead Waterworks:
Concluded on Thursday, September 26th, 1878, at twelve o'clock noon.

To the Editor of the "Live Stock Journal."

"OUR Committee being of opinion that their report will obtain greater publicity if it should take the form of a letter to yourself instead of being printed and circulated privately, we shall be obliged if you will make known to your readers the results of the late Tournament.

"Our object, as stated some months ago in the *Live Stock Journal*, was—

- "(1.) To ascertain whether Incubators were of any practical value to the public generally, and
"(2.) If proved to be of value, to decide which was the best Incubator for the ordinary purchaser to select.

"The Incubators were entrusted to the engineer with strict injunctions to follow implicitly the instructions of the exhibitors, and to admit no one without a written order from the Committee to the room, which was to be kept locked, especially the exhibitors themselves or their agents. The following are the statistics of the competition itself, which were attached to the incubators as soon as possible after mid-day on September 26th.

Name of Incubator.	Mode of Heating.	No. of Fertile Eggs in Incubator.	Hatched by 12 o'clock noon, Sept. 26	Percentage of Eggs Hatched.	REMARKS of the Committee.
VOITELLIERS . . .	Hot Water.	35	none	0	No chickens were found in the eggs.
CHRISTY's Hydro-Incubator .	Hot Water.	45	34	75.55	Three more chickens were hatched alive after the competition had closed. The other eggs, on being examined, were all found to have living chickens in them. The Prize of £25 was awarded to this incubator.
CHRISTY's Hydro-Incubator .	Hot Water.	45	20	44.44	Two chickens were hatched alive after the competition was ended. Of the remaining eggs ten were found to have living chickens in them.
BOYLE's	By Lamp.	40	11	27.55	
BOYLE's	By Gas.	42	none	0	
PENMAN's	By Lamp.	40	none	0	Twenty dead chickens were found in the eggs, having been dead apparently several days.
PENMAN's	By Gas.	46	none	0	The lamp in this Incubator worked very irregularly, needing constant attention by day and night.

"The chickens hatched are doing well, some under hens, some in Artificial Mothers.

"We have confined ourselves to facts, and have suppressed our own opinion as far as possible, nothing extenuating, and most certainly setting down nothing in malice. We only wish that we could congratulate each exhibitor with the same good reason as we can congratulate Mr. CHRISTY upon the result of the Tournament."

HERBERT R. PEEL, } Secretaries to the
SAMUEL STALLON, } Incubator Committee.

Register of the Christy Prize Hydro-Incubator during this competition.

Number of Working Days of Incubator.	Date of Month.	Temperature of Atmosphere in the Room.		Heat of Water put in Incubator ought to be 212°		Heat of Water coming out of Incubator.		Heat in the Drawer.	
		M.	N.	M.	N.	M.	N.	M. 8 a.m.	N. 8 p.m.
1	5	77	78	212	212	—	125	95	103½
2	6	78	78	212	212	129	125	104	104½
3	7	71	77	212	212	130	129	103½	104½
4	8	75	76	212	212	130	129	104½	104
5	9	74	75	212	212	130	130	104½	105
6	10	73	75	212	212	130	129	103½	103
7	11	73	72	212	212	130	130	103½	105
8	12	73	72	212	212	130	130	103½	103½
9	13	72	70	212	212	130	130	103	103½
10	14	70	73	212	212	130	130	104	103½
11	15	72	71	212	212	130	130	104	104
12	16	71	72	212	212	130	130	104	104
13	17	70	72	212	212	130	130	103½	104
14	18	73	74	212	212	130	130	104	104½
15	19	70	72	212	212	130	130	101½	103
16	20	73	70	212	212	130	130	102	103
17	21	73	72	212	212	130	122	101	100
18	22	69	68	212	212	130	130	104	100
19	23	68	67	212	212	130	130	103	101
20	24	63	69	212	212	130	130	103	103
21	25	64	67	212	212	130	130	102	101
22	26	65	..	212	..	130	..	100	..

[From the *Live Stock Journal*, April 18th, 1879.]

The best proof I can give that Mr. Christy's success was fairly earned and well deserved, is that the Incubator which won the first prize is now in my possession, as I purchased it from Mr. Randall Cooper, who bought it at the show, and that during the last severe winter, whilst other Incubators which I use (for I do not use Christy's exclusively) have been a comparative failure, this one has never failed to hatch out as large* or even a larger percentage of chickens from fertile eggs than that which gained it the first honours in the tournament of 1878. Several intending competitors in this year's tournament promise to produce machines of greater simplicity of construction than even that of Mr. Christy. They must remember that good workmanship and quality of material are no less elements of success in Incubator contests than simplicity of construction.

Bedford Hotel, Brighton, April 15th, 1879.

HERBERT R. PEEL.

THE HEMEL HEMPSTEAD INTERNATIONAL INCUBATOR COMPETITION OF 1879.

From the *Live Stock Journal* of October 10th, 1879.

TO THE EDITOR.

SIR,—I am requested by the Committee appointed to conduct the Hemel Hempstead Incubator Tournament to forward you a report of the working and results of each Incubator engaged. These results, together with two protests, received on October 1st, one signed by Mr. Cashmore alone, and the other by Messrs. Howell, Cashmore, and Watson conjointly, were submitted, with other correspondence, to the judge of the tournament, Mr. Matthew Leno, on Monday evening, October 6th. *The protests, upon investigation, were pronounced by Mr. Leno to be frivolous and vexatious, and the GOLD MEDAL, of the value of 10 gs., was awarded by him to Mr. Thomas Christy, of 155, Fenchurch Street, London, for the results of his Incubator No. 2.* The Committee wish it to be stated that, as residents in Hertfordshire have now had the opportunity of ascertaining the results of

* 75.55 per cent.

Incubators worked both by inexperienced, and also experienced hands, they do not recommend that these competitions should be continued for the future in connection with the Hemel Hempstead Poultry and Pigeon Show.

October 7th.

HERBERT R. PEEL.
Hon. Sec. to the Incubator Committee.

RESULT.

THOS. CHRISTY & Co.'s HYDRO-INCUBATOR FIRST.

GOLD MEDAL.

Eggs placed in Incubator	...	...	...	...	...	80
Found fertile	...	...	...	...	71	
Found infertile	...	...	...	...	9	
Eggs broken during competition	...	...	...	1		
Chickens hatched...	...	...	...	69		
Eggs unhatched	...	...	...	1		
				71		

Per-centage of eggs hatched, 97.18.

POULTRY APPLIANCES AT HEMEL HEMPSTEAD SHOW.

From the *Field* of October 4th, 1879.

The Hemel Hempstead exhibition is characterised by some very useful conditions. There was a competition of Incubators, THE PRIZE BEING AWARDED TO CHRISTY'S HYDRO-INCUBATOR, which hatched out a large percentage of chickens* The prize for poultry appliances was awarded to Reynolds of Compton Street, for a very good selection, including some good fountains, and very perfect coops for hens with chickens.

Christy showed a good basket for sending fowls a distance to market or on a long journey, as it contains a water supply not easily exhausted.

The acting committee and honorary secretaries worked with a will, consequently the show was a success from all points of view.

REPORT OF THE AYRSHIRE AGRICULTURAL ASSOCIATION,

MESSRS CHRISTY'S EGG INCUBATOR.

12, Midton Road, Ayr, 19th April, 1879.

The "Hydro-Incubator" entered by Messrs. T. Christy & Co., London, for exhibition at the ensuing show of the Ayrshire Agricultural Association, to be held in Ayr on the 29th and 30th days of April, 1879, has been, in accordance with the Association's request, fully tested by me in company with the gentlemen whose certificate is appended to this report. The subjoined table will show the various temperatures obtained during the trial. Before giving an explanation of the mode the machine was worked, I beg to state that the "Hydro-Incubator" was the first Incubator I had ever seen, and that I was entirely ignorant of its working until the machine was put into my hands for testing, I very carefully studied the instructions sent out by Messrs. Christy for the working of the Incubator, and during the trial I have tried to follow them as closely as possible. The Incubator was filled up with hot water, which was emptied out at the end of twelve hours. It was again filled, and every twelve hours a few gallons of water put in. In presence of a number of gentlemen 64 marked eggs were placed in the drawer of the Incubator. The testing of the eggs to find out the fertile from the non-fertile, and the hatching of the chickens were done in the presence of the same gentlemen. The following is the result obtained :—

Number of eggs put in Incubator	...	...	...	...	64
Ditto found non-fertile	...	...	...	...	25
					39
Ditto hatched out	...	...	...	...	28
Ditto of chickens dead in shell, fully matured, but too weak to break shell...	...	...	...	...	7
Ditto of chickens apparently a day or two dead	...	...	...	...	4
					39

Being a percentage hatched of 71.31.

* 69 chicks from 71 eggs.

During the course of the trial the weather was extremely variable, hard frost, snow, rain, and sometimes fine weather, and although the machine was in a room in which a fire was kept constantly burning night and day, a glance at the temperature attained will show the effect of the weather. I had a tin kettle constructed that would hold and boil 4 gallons of water, and I experienced no difficulty in getting the boiling water introduced into the Incubator at 212 degs. F., and after a little practice in being able to determine the quantities to be put in to keep the temperature in the drawer at the requisite heat. The time taken in drawing off the water, turning the eggs, and pouring in the hot water at 8 A.M., averaged from 15 to 20 minutes, and at 8 P.M., 10 to 15 minutes. The machine is easy to work, and, unless in cold weather, when it is judicious to add a few quarts of hot water between the 12 hours, does not take up your time more than 25 to 35 minutes per day. The chickens were all put under the Hydro-Rearing Mother, where they seemed to be quite at home, and perfectly able to look after their creature comforts.

DAVID CALDWELL.

Report by Committee associated with Mr. Caldwell in the testing of the Incubator above referred to:—

We, the undersigned, were present when the eggs were placed in the Incubator, above referred to, when they were tested, and when the chickens were hatched, and are perfectly satisfied at once with the fairness of the test, the simplicity and excellence of the machine, and its capability for discharging the functions assigned to it.

DAVID YOUNG, 1, Queen's Terrace.

W. G. WALKER, The Old Manse.

ROBT. SCOULAR, Dutch Mills.

WM. M'CRACKEN, Kyle Union.

WM. ROBERTSON, Buckingham Terrace.

} Ayr. N.B.

19th April, 1879.

TRIAL OF A HYDRO-INCUBATOR AT SUDBURY.

From The Live Stock Journal of Dec. 19th, 1879.

OFFICIAL REPORT.

Sudbury Fat Cattle Club, 9th December, 1879.

On the occasion of the Fat Cattle Show at this town, we, the undersigned, were associated with Mr. J. F. Hills in the management and working of an incubator lent to the Committee of the show by Mr. Thomas Christy of London.

On the arrival of the machines, Mr. Hills took charge of them, and entirely managed the working. We assisted in verifying the facts from stage to stage, so as to be able to make up a report of the result obtained from the eggs, not one of us having previously seen an incubator worked.

From the appended copy of register of working of the machine, the following result, it will be seen, was obtained:—

Eggs put in Incubator	...	...	...	...	...	...	90
Removed unfertile	...	...	...	...	...	...	18
Broken in turning	...	...	...	...	...	...	2
Addled	...	...	...	...	...	...	4
Hatched out	...	...	...	...	...	...	61
Chickens dead in shell, matured	...	...	...	...	...	...	3
Chicks dead in shell, from 3 to 5 days	...	...	...	...	...	...	2
							90
							90

IT WILL THUS BE SEEN THAT 61 CHICKENS HATCHED OUT OF A POSSIBLE 66 EGGS, and this under the most severe test to which an incubator could possibly be subjected—as, on the opening day of the Cattle Show, the machine was transferred to the Lecture Hall, where the principal part of the hatching took place. Besides the removal, the cold in this hall was so intense as on one occasion to register eight degrees frost, and water which had been spilled in working the incubator actually froze on the floor.

In conclusion, we must state our high appreciation of the pains and trouble bestowed by Mr. Hills in working this Hydro-Incubator without the slightest knowledge of any incubator, or even poultry in general.

The result obtained—of 93.43 PER CENT. OF THE EGGS WHICH COULD POSSIBLY BE HATCHED—speaks more in favour of such a means of artificial chicken-

producing than any praise from us could do. The chickens—excepting five lost the first day through not allowing them to dry—are all doing well under a hydro-rearing mother fitted with glass frames.

To the entire truth of this report we are witness, and we certify to the correctness of the register of working kept by Mr. Hills, and to the astonishing results obtained.

HENRY MEEKING, Hon. Sec. to S. F. C. Club.
GEO. CARDINALL, Chilton Hall, Sudbury.
STE. CARLTON, Waldinfield.

TO THE EDITOR OF THE *Live Stock Journal*.

SIR,—The practice of incubation being of considerable interest at the present time, the following facts may not be without interest to your readers. I may at once admit that I am quite a novice in the poultry line; I never keep any fowls, never set a hen in my life—and that any knowledge I may possess of hatching chickens, or incubators, is from reading the various reports in the papers and books on the subject.

A short time since, the members of the Fat Cattle Club held in this town, proposed to hold an exhibition of dead poultry, &c., in connection with it, and it was thought, provided one could be obtained, that an Incubator at work would prove a great attraction, and materially help the receipts. Accordingly it was left to me to try and get one, and also undertake the management. Not thinking that any of the various makers would lend a machine, I took the liberty of writing to Mr. LEWIS WRIGHT, having read his work on poultry, and thinking probably he would have a machine, or know some one who had who would lend it. Mr. Wright, it appears, sent my letter to Mr. Thos. Christy, and this gentleman very kindly promised to send me down one of his incubators, foster-mothers, and everything complete.

When the idea entered our minds of having an incubator, we had no other intention than that of giving additional interest to our show. And we had no thought of testing any particular machine, or of producing a certain percentage of chicks. I had, however, no alternative but to accept Messrs. Christy's kind offer. And as the percentage of result obtained was requested to be made known, I felt put on my mettle a little, and in justice to the incubator, felt that I was in duty bound to carry out the instructions to the very letter, that it should not be said it was any fault of mine if it failed.

On Friday, the 7th November, the apparatus complete, most carefully packed, arrived. The Incubator I set up in my kitchen, and filled with boiling water. On Monday morning, the 10th, I put in the first 10 eggs, having first named and dated them; at night put in 10 more. This I continued doing till Friday morning, putting in the last 10, making 90 eggs in the drawer, which, with the thermometer, was now quite full.

From the various reports I had read, I quite expected chicks from the first lot of eggs on Monday the 1st December, but no chicks were visible, and I felt quite frightened, and I wired to Messrs. Christy & Co., to which they wired back, stating chicks would probably not be hatched till the following day. This very much relieved my mind. The following day, Tuesday, the 2nd, fifteen chicks hatched out, the next day ten more. The following is the total result:—

Eggs put in drawer...	...	...	...	...	90
Removed unfertile ...	...	...	...	...	18
Broken in turning, &c. ...	...	...	...	...	2
Added ...	...	...	...	...	4—24
<hr/>					
Good eggs ...	...	...	...	...	66
Hatched out ...	...	...	...	...	61
Chicks dead in shells, fully matured ...	...	...	...	...	3
Chicks dead apparently three or four days ...	...	...	...	...	2
<hr/>					
66					

It will thus be seen that 61 hatched out of a possible 66, and this I consider under the most adverse conditions, at least, I judge so by what I have read, as I have never seen any account of work done under such circumstances. After the incubator had been at work in my kitchen over 20 days I emptied it of half the water, in order that the men could the better carry it, and removed it to the Lecture Hall, when the thermometer stood at 10 degrees below freezing, and the hall itself was very cold, the thermometer in it standing at 40°, and fell to 30° during the night. Notwithstanding this 10 chicks hatched out the next day. The following day the hall was colder still, and on Saturday, the 6th, the hall was eight degrees below freezing, and yet the chicks were hatching out at the same rate. I consider it must have been a severe test to remove the incubator in this

manner, especially as the severe frost set in just at the time; and could it have remained in my house until the chicks were due, I believe every good egg would have hatched.

Through want of experience I lost five chicks by putting them in the foster-mother too soon after they were hatched. No doubt they should be kept in flannel near a fire, for at least a day or even a day and a half, as the stronger chicks are apt to trample on them. With the exception of these five, all the chicks are doing well under the mother, although the heat has never been above 36° since they were put in, and has been as low as 24°. The heat in the mother keeps up to 55° and even 60°.

A very curious incident happened. In addition to the two eggs broken a third was very badly cracked. This I repaired, pasting over the damaged part a piece of gummed paper off some postage stamps. And I may say, much to our surprise, a fine healthy chick completed the fracture, and with assistance (as the salvage of the postage stamp prevented the shell separating), was hatched, and is now a fine healthy bird in my possession. So cold was the Lecture Hall on Saturday night, the 6th, that some water which was split in working the machine, formed a sheet of ice all round and under the hydro-incubator.

Sudbury, Suffolk, Dec. 9th, 1879.

JOSEPH F. HILLS.

TRIAL OF INCUBATOR AT KENDAL.

From *The Live Stock Journal*, December 24th, 1879.

OFFICIAL REPORT.

The Hydro-Incubator and appliances kindly lent by Messrs. CHRISTY & Co., London, for trial and exhibition at the Kendal Poultry, Pigeons, Dogs, Canaries, and Cage-birds show, to be held on December 31st, 1879, January 1st and 2nd, 1880, was handed over by the Committee to our charge for testing. Permit us to inform you that the Hydro-Incubator was the first we had seen, and we were ignorant of its working until we had placed in our hands the valuable work, entitled "Hydro-Incubation in Theory and Practice."

After studying the rules laid down in this work, we found no difficulty in adhering to them, and obtained the following successful result:—

Number of eggs put in Incubator	...	...	...	...	...	73
Number of eggs unfertile	...	...	...	...	...	42
						— 31
Number hatched out	...	...	...	...	...	22
Number of chicks dead in shell, fully matured, but too weak to break shell	...	...	...	...	...	1
Number of eggs broken during incubation	...	...	...	...	...	1
Number of eggs added (germs) about eight to ten days	...	...	...	...	...	7
						— 31

This result is therefore at the **RATE OF 70·97 PER CENT.** deducting only those eggs proved unfertile by the tester after six days' incubation, but it is **REALLY 95·65 PER CENT. OF "HATCHABLE EGGS,"** deducting the broken and added eggs with the unfertile ones.

During the course or trial the weather was extremely severe. On one occasion the thermometer registered 22° of frost.

The daily register will show the severe test the apparatus was put to. However, by careful attention, we obtained the above, and are perfectly satisfied with the result. The large number of unfertile eggs was owing to the severity of the weather, and this also being the worst season of the year for hatching purposes. The chicks were put under the Hydro-rearing-mother, where they seem perfectly at home, and quite content. We have had several well known fanciers to see them, and they pronounce them equal to or better than any chicks they have seen under a natural mother.

E. THOMPSON.

J. HARRISON.

We, the undersigned, have been constant visitors during the process of incubation, and have great pleasure in testifying to the correctness of the above report.

BENJAMIN DAVIS, Jun., Highgate, Kendal.
JAMES SMITH, Jun., (Jeweller), Kendal.

Dec. 22nd.

THE HYDRO-INCUBATOR AT ELGIN.

From *Live Stock Journal*, Jan. 2nd, 1880.

The following is the report of the Sub-Committee appointed to superintend the management and working of the Incubator:—

At the Elgin Poultry, Pigeon, and Cage-bird Club's third annual show held here yesterday and to-day, there was exhibited a set, No. 3, of Thomas Christy and Co.'s

appliances, consisting of hydro-incubator, drying-box, and open-air rearer. The machines were kindly lent to the Club for a month, in order to be tested by a sub-committee, who were appointed for the purpose.

The working of the Hydro-Incubator commenced on the 19th November. It was placed in a vacant room of a private house. None of the Committee had previously seen an incubator, and they had to be guided solely by the instructions given in Mr. Christy's pamphlet on "Hydro-Incubation." The object of the Committee was to have chickens hatched a week previous to the show, and to continue the process of hatching up to the date of the show, so as to give poultry breeders an opportunity of seeing chickens under the rearing-mother, and to see the Incubator in working order. Eggs were placed in the Incubator on the evenings of the 19th, 22nd, 25th, and 26th November. All the eggs were tested eight days after being placed in the Incubator, and unfertile ones removed. There were found to be **FIFTY FERTILE EGGS**, of which **THIRTY-SIX HATCHED** out chickens, being a **PER-CENTAGE OF 69.23**. Of the sixteen eggs unhatched eleven contained dead chicks fully formed, and the others had died at earlier stages of incubation.

The show commenced on the morning of the 18th December. There were then five eggs unhatched in the Incubator. The eggs were then removed from the machine, which was then carried to the show hall half-a-mile distant, and the eggs again placed in it. Four of these eggs hatched out chickens in the morning of the second day of the show.

With the exception of one chick that died on the day it was hatched, all the chickens are strong and vigorous. They were shown in the rearing-mother during the two days of the show, and the general remark by poultry breeders was that they had never seen more lively and vigorous chickens.

From the 19th to 28th of November the weather was fine. From the 29th November to 13th December there was a snowstorm with intense frost. The readings of the thermometer were lower then they had been for several years.

Taking into consideration the severity of the weather during the greater part of the course of trial, and that the working of the Incubator was in inexperienced hands, the Committee consider that their trial of the Incubator and rearing-mother is very satisfactory, and that the practical utility of the machines has been clearly shown.

(Signed)

J. PIRIE.
L. MACKINTOSH.
ALEX. MATTHEW.
MICHAEL ANDERSON.
PETER GRANT.

Elgin, Dec. 19th, 1879.

CAMBRIDGESHIRE ORNITHOLOGICAL SOCIETY.

From Cambridge Chronicle, Jan. 17th, 1880.

The members of this Society held their annual show on Tuesday and Wednesday last, in the New Corn Exchange, Cambridge. The collection of poultry, pigeons, canaries, and other cage birds, was on all sides declared to be the largest and best ever brought together in this town or neighbourhood. On Wednesday night the building was thronged with visitors, and it would be difficult to say which department attracted most attention. The cage birds were very popular, especially with the lady visitors. Near the entrance was exhibited one of **CHRISTY'S HYDRO-INCUBATORS**, which was surrounded by a wire netting. The apparatus and its numerous tenantry of chicks and ducklings were objects of general curiosity and attention, and in the basketful of eggshells standing close by showed that they had very recently emerged into daylight. The operation of the Incubator will be understood from the following letter from the vice-chairman of the association, Mr. John Smith:—

SIR,—The subject of hydro-incubation being so prominently before the public at the present time, I thought the exhibition of the appliances after having proved their efficacy, would be an additional attraction to the Ornithological Society's show at Cambridge. I accordingly wrote to Messrs. Christy to ask if they would lend the Society a Hydro-Incubator, with rearing mother, &c. They very kindly acceded to my request without hesitation, stipulating only that I should send you a full report of my success. This I have much pleasure in doing. It is as follows, viz:—

No. of eggs put in Incubator	...	...	...	90
No. of eggs removed as addled and unfertile	...	...	...	47
				—
Good eggs	...	...	...	43
No. hatched out	...	...	...	37
No. died in shell fully matured	...	...	...	6
				—
Per-centage	86.05			43

I feel sure that the large number of unfertile eggs was owing to the fact that they were laid during the severe weather in the first week in December, and probably were not taken from the nest before the frost touched them. I may say that I am not a poultry fancier, that I had never seen any incubator in use, and that I know nothing from practical experience of the breeding and rearing of poultry. One chicken died after it had been hatched 25 hours, but the remaining 36, with two exceptions, are strong and healthy, and I am told by those who understand them that they are remarkably good for the time of year.

I am Sir, yours truly, J. SMITH,

Vice-Chairman of the Committee of the Cambs. Ornithological Society.
Poplar House, Hills Road, Cambridge.

TRIAL OF INCUBATOR AT CAMBRIDGE.

SIR,—Judging from inquiries I have received, my report of the working of the Hydro-Incubator appears to be incomplete. Will you therefore allow me to add the following:—

The Incubator was worked in a room, which was used for business purposes, behind my shop, the door of which was constantly open all day, the Incubator standing nearly opposite it, thereby making it exceedingly draughty for the machine, and necessitating on *business days* a larger supply of hot water. To prove that the draught occasioned this, it is only necessary to notice the register of the different temperatures from the Saturday nights to the Monday mornings when it will be seen that though less boiling water was used, the heat in the drawer was higher, and this too *without the fire and gas burning in the room as on business days.*

(Signed) JOHN SMITH.

A Christy's Hydro-Incubator is kept in constant work at the Agricultural College, Downton, for the instruction and use of the Students.

RESULTS OBTAINED BY PRIVATE BREEDERS.

BONCHURCH, ISLE OF WIGHT, 24th September, 1881.

"The heating apparatus you sent for the Incubator answers perfectly. I shall feel obliged by your sending me a similar one with fittings for the other Hydro-Incubator."

J. SNOWDEN HENRY.

KITTERY YORK, Co. MAINE, May 4th, 1881.

"I take much pleasure in informing you that the Incubators have done very well, viz., in one 64 eggs gave 45 chicks, in the other 78 eggs gave 67 chicks. We are quite pleased with the result."

R. W. SARGENT,

Sole Agent in the U.S. for MAJOR A. C. CROAD.

ASKEW, DONCASTER, MAY 20th, 1881.

"I have tried the Hydro-Incubator supplied by you to Mrs. Wright, of Clitheroe, with great success, having hatched out alive and well 68 chickens from 82 eggs (including those unfertile). The temperature was never below 101° nor exceeded 106°."

W. DARLEY.

DUNSTABLE, BEDS, June 7th, 1881.

"Please send me (for W. B. Greenfield, Esq.) a Reaver to match the 90-egg Hydro-Incubator you sent some time since. I am pleased to state the machine is giving great satisfaction."

TRIBSCHIN, LUZERN, SWITZERLAND, June 8rd, 1881.

"I have been working your 90-egg Hydro-Incubator, which I bought of you last year, and find it to answer very admirably. There is no doubt about it; I am at least a month ahead of my friends who trust to the hen."

THOS. MILES FLEMING.

RICKMANSWORTH, 23rd June, 1881.

"You will be glad to hear I have just had a very good hatch of ducklings, the last for this season, 43 ducks out of 49 eggs, 5 clear and 1 added."

W. CHAMBERS.

BOTLEY, HANTS, July 1st, 1881.

"Mrs. PHILLIMORE has been very fairly successful with the Incubator, and finds it most interesting and easy to work. The chickens and ducklings hatched out are considered to be unusually fine ones."

ERNE, HEAD, GRANARD, IRELAND, July 21st, 1881.

"Miss DOPPING has been successful for a first attempt, and in the worst month in the year for hatching. She had 14 chicks from 21 fertile eggs, and 10 ducks from 13 fertile eggs. Mr. Christy's book on Hydro-Incubation was her sole guide. The Syphon (now Cottager) does very well for hardy birds. 18 of the 24 were extremely strong *lively birds*. One met with an accident, and 6 were weak from the first and have died."

WINCHESTER, August 21st, 1881.

"Between two and three years since I had from you a 90-egg Hydro Incubator and Mother. I found both answer so well that I sent them out at the end of a year to New Zealand to my brother, whose wife is much delighted with them."—MARY LAIRD.

STEVENAGE, HERTS 17th October, 1881.

"I got 60 chicks from 89 eggs at my first attempt, 53 alive and well. The Incubator was worked with the outside boiler, heated by an oil lamp."

ARTHUR PIGGOTT.

"The MARCHIONESS OF DROGHEDA" (2nd May, 1881) "encloses Mr. Christy the Register, showing results of the Hydro-Incubator, which she considers highly satisfactory, and she and Lord Drogheda are much pleased with it. All the chickens are strong and healthy, and doing well under the Rearing Mother." Result obtained.—54 chickens hatched out, 5 dead birds, 4 addled, and 26 unfertile eggs (removed 9th day) in a Christy Hydro-Incubator, worked by outside Circulating Boiler and Oil Stove.

MAJOR A. C. CROAD, Durrington, Worthing, writes, March 10th, 1881:—"I made favourable mention of your Incubators and Rearers, both of which I think most highly of. The chicks come out cleaner in the Incubator, and the Rearing Mother I consider invaluable. I only lost two or three weakly birds at starting last year; the others proved as strong as any I ever possessed. Not any of my Hens or Pullets have evinced a desire to sit yet, and I should be at a great loss now without your useful little machines"

A. C. BRADBURY, Esq., Nuttal.—"Result of Chickens hatched in one of Christy's 90-Egg Hydro-Incubators: To January 29th, 1881, from 85 fertile eggs 67 chickens. From January 29th; with one of Christy's 90-Egg Hydro-Incubators, fitted with outside Circulating Boiler, heated by gas from 30 to 60 minutes night and morning, managed entirely by my daughter, a girl of twelve years of age, to the present time, 159 fertile eggs tested, 149 chickens hatched. The chickens are under Christy's Rearing Mothers, and I do not recollect ever having had better success in rearing than this season."

JAMES GIRVIN, Esq., Formby, near Liverpool, 26th April, 1881.—"Having used your Incubators for more than a year, I am very glad to be able to bear testimony to their complete success. We have now about 300 chickens and 350 ducks, all doing very well, and more hatching out every day. I may mention that out of a drawer full (about 85), we hatched 80 birds, ducks, and chickens."

HERBERT THELLUSSON, Esq., Doncaster, April 25th, 1881.—"My Incubators are now working so well and easily, I must write you of my success. When I last saw you I had hatched about 300 chickens (in the beginning of this year). I have been going steadily ahead, and have now a grand show of young chickens and ducks. The last hatch I had I think extremely good. I put in 26 ducks' eggs, of which 4 were unfertile. After a week I put them in another drawer, and filled it up with hens' eggs. I forget the number, but on the 20th day I got 63 chickens, and on the 27th day of the ducks I hatched out the whole 22. I am very sorry now I did not build my Incubator-room bigger. I could have worked five or six just as easily I now do my three, from a big boiler in the kitchen. The new pattern Out-door Rearer is better than the old one, more room, and easier to clean."

WALTER BRIDGMAN, Esq., D.A.C.G., Limassol, Cyprus, 24th January, 1881:—"Your Incubator has hatched me 42 chickens."

THOMAS LAMBERT, Esq., Junr., Hadlow, Kent, April 14th, 1881:—"I am happy to say I have had great success in my first attempt with your Hydro-Incubator, having hatched from first 10 eggs, 10 chicks, and all alive and strong. Second 10 eggs, 8 hatched, 2 addled. Third 10 eggs, 8 hatched, 1 dead chick. Fourth 10 eggs, 9 hatched, 1 addled. I am now taking out of 10 more eggs, 8 chicks, 2 addled (total, 50 eggs, 43 chicks, say 86·00 per cent.)"

MAJOR CHADWICK, Forbes, N.B., April 19th, 1881.—"I have just had one lot of chickens out of the Incubator, and am expecting another lot to-morrow or next day. We got 68 chickens out of 95 eggs."

C. W. WILSON, Esq., Kirkby Lonsdale:—"The Stove is a grand one, and answers well. I must convert my old one. Send me two Stoves and a Circulating Boiler . . . It is a great improvement on the old plan—so much less trouble."

MRS. ELBRINGTON, Bishops Waltham, February 24th:—"I am having capital success with your Incubator, and am quite satisfied with it."

MISS SYMONDS, Lichfield, February 27th, 1881:—"Last year I purchased from you a cheap 90-Egg Hydro-Incubator. It has given me the greatest satisfaction."

A. WITHER, Esq., Stranraer, February 26th, 1881:—"The boiler attachment is a great convenience."

LISTON YOUNG, Esq., Tunbridge Wells, March 11th:—"We are getting on very successfully with your Incubator."

G. A. DE M. MATTHEW, Esq., Felixstowe, Ipswich, March 13th:—"I have hatched out 45 fine healthy chicks. They are stronger and healthier than any I have ever hatched under hens."

W. G. MARTON, Esq., Harold Wood, Romford, March 14th, 1881 :—" I may let you know that out of 26 good eggs I have alive 25 chickens.

W. D. DUNCAN, Esq., Denny, N.B., 18th March, 1881, has been most successful in hatching, and especially in rearing. He reared all his chicks, hatched by hens, under your Hydro-Rearers."

JOHN KENDALL, Esq., Rhyl, March 23rd, 1881 :—" Last season Sir W. G. Williams purchased one of your 90-Egg Hydro-Incubators, and he is now anxious to supplement it with a larger one, and is inclined to have the Commercial for 250 eggs, and also another Open-Air Rearer."

Mrs. E. M. COCHRANE, Longford, March 25th, 1881 :—" The Hydro-Incubator Mr. Cochrane got from you is proving very successful."

Mrs. WYCHE completed the hatching on Saturday last (March 26th, 1881) with great success. From the 90 eggs there were 70 birds, 65 still alive (April 2nd), doing well.

G. MACGILL, Esq., Littleborough, 30th April, 1881.—" I may inform you that the Hydro-Incubator I had from you last season is giving excellent results this year, hatching, on an average, nearly 90 per cent.

Mrs. C. FULLER, Vicarage, Bexley, May 11th.—" On April 19th I placed 90 eggs in one of Christy's Incubators, and on the 10th of May had the satisfaction of successfully hatching out 62 chicks. Of the 90 eggs 18 were nonfertile."

A. C. BRADBURY, Esq., April 30th, 1881.—" Please send me some more Registers for Outside Circulating Boiler. I had 22 chickens, from 25 fertile eggs, hatched the other day in the new machine."

C. R. COLVILLE, Esq., Lullington, Burton, writes, February 6th, 1881 :—" We have had two hatches this spring, the first of 39, which have stood all the cold weather; the other, just out, 68 in number, hatched during the frost."

MR. THOS. HUGHES, The Gardens, Llanforda Hall, Oswestry, February 14th, 1881—" I have worked one of your Hydro-Incubators and Rearers for Mr. LANGUEVILLE for this last ten months with the greatest success. Fifty-four was the least hatch since I started, and I can safely say I have hatched and reared, in Chickens and Ducks, some hundreds."

The foregoing TESTIMONIALS are all of work done during 1881, and many hundreds of others during the three preceding years can be given. Amongst the distinguished Patrons of Christy's Hydro-Incubators are found the names of **H.R.H. The PRINCE OF WALES, H.R.H. PRINCE LEOPOLD**, The EARL OF MACCLESFIELD, Tetsworth; EARL RADNOR, Longford Castle, Salisbury; MARQUIS OF AILSA, Ayr; LORD WENLOCK, Escrick, Yorks.; LORD SUDELEY, Winchcombe, Glos.; DUCHESS OF HAMILTON, Wickham Market; the COUNTESS LOVELACE, Leatherhead; LADY WILLIAM G. OSBORNE ELPHINSTONE, Kincardine-on-Forth; LADY ARTHUR HILL, Hayward's Heath; LADY DARTMOUTH, Patshull, Wolverhampton; the Hon. Mrs. CECIL HOWARD, Hinkley; Sir JOHN HARTOP, Epsom; the Rev. H. R. PEEL, Hemel Hempstead; JOHN COLEMAN, Esq., Escrick, Yorks.; Hon. SLINGSBY BETHELL, Basingstoke; T. T. LEONARD, Esq., Bangalore; M. W. WEMYSS-COLCHESTER, Esq., Mitcheldean; H. SAWTON, Esq., Twickenham; Professor BALFOUR, Trinity College, Cambridge; LEA PRIESTLEY EDWARDS, Esq., Easingwold; T. GILROY, Esq., near Dundee; G. COLLINS, Esq., Ringwood, Hants; Mr. T. STAMMERS, Cliff House, Atherstone (60s. Hydro-Incubator); T. SALTER, Esq., West Bromwich; C. WINGFIELD, Esq., Onslow, Shrewsbury; J. W. ELWES, Esq., Winchester; H. MOSER, Esq., Christchurch; C. W. WILSON, Esq., Carnforth; W. L. DODGSON, Esq., Ludlow; A. WITHER, Esq., Stranraer; R. BELL, Esq., Thirsk; T. W. L. HIND, Esq., Kendal; T. MASON, Esq., Brentwood; Prof. WRIGHTSON, Downton, Salisbury; Colonel DUNCAN BAILLIE, Lochloy, N.B.; P. F. LE SUEUR, Esq., Jersey; J. J. LEVETT, Esq., Burton-on-Trent; Miss AGNES SHARP, Tunbridge Wells; Miss HOBBS, Braintree; Miss McKELLIE McCALLUM, Braco Castle, N.B.; Miss CLERK, Rolleston Hall; Mrs. PAYNTER EDWARDS, Throbury; Mrs. KETTLEWELL, East Harptree, Bristol; Mrs. HOLDEN, Upminster Rectory, Romford; Miss MONCRIEFFE, Lyndhurst; Mrs. JOHN LANGTON, Wandsworth; Mrs. L. E. WILSON, Dulwich; Miss PRESCOTT, Brough, E. Yorks.; Mrs. HYDE, Bloxham; Miss BRADSHAW, Bishopstoke; Mrs. A. LONGMAN, Hemel Hempstead; Mrs. PINDER, near Grantham; Mrs. M. ROBINSON, Crawley, Sussex; Miss IDA BRINKLEY, Kingstown; Mrs. CHANTER, Bridgwater; Mrs. DALISON, Tunbridge; Mrs. D'OYLEY, Canterbury; Mrs. LEATHAM, Cirencester; Mrs. ASTLEY, Tring; Mrs. FRANK, of Derbyshire; Miss P. B. JONES, of Clonakilty, Ireland; Mrs. GRANVILLE, of Ivybridge; Mrs. NEWTON, Brockley Park; Mrs. PARBURY, Bickley; Mrs. GILSON, Natal; Dr. VINES, Littlehampton; Rev. H. BARTER, Chipping Norton; Rev. W. LAW, Market Harbro'; Rev. R. PELLX, Walthamstow; R. KING WYNDHAM, Esq., Bishop's Waltham; Col. NAYLOR, Ruthin; W. CUNARD, Esq., Twickenham; L. INGALL, Esq., Sevenoaks; J. HUNT, Esq., Hampstead Norris; A. PERRY, Esq., Northampton; J. SNOWDEN HENRY, Esq., Bonechurch, I.W.; C. E. LYON, Esq., Eccleshall; W. E. FITT, Esq., Weeke, near Winchester; FRANK WILLAN, Esq., Pangbourne; E. STANLEY HICKSON, Esq., Cartmel Fell; J. TILLARD, Esq.,

Ardingley, Sussex; E. L. HARRIS, Esq., Romsey, Hants; D. CALDWELL, Esq., Ayr; R. BOSS, Esq., Kelso; C. K. ANDERSON, Esq., Middlesborough; GEO. H. PROCTOR, Esq., Durham; W. LAVERS, Esq., Harrow; G. P. GIPPS, Esq., Lymington, Hants; JAS. BURNETT, Esq., Tamworth; WM. DREWITT, Esq., Petworth; J. P. CURRIE, Esq., Esher; W. C. CAZALET, Esq., Dorking; E. L. PALMER, Esq., North Molesey; J. F. WELLS, Esq., Little Dunmow; W. L. SERVICE, Esq., Chigwell; R. E. CHATFIELD, Esq., Chingford; W. G. MARYON, Esq., Harold Wood; Capt. TURNER, Ringstead; Messrs. MUNRO, of Lisbon, DELA FORCE, of Oporto, &c., &c.

At most Shows, birds hatched and reared in Christy's Hydro-Appliances have taken Prizes and Honours. Mr. T. P. LYON (Game), Mr. R. KYRKE PENSON, Mr. VIGERS (Bantams), Mr. A. COMYNS (Dark Brahmas), Mr. JOHN C. FRASER, the Rev. H. R. PEEL, Mr. BRADBURY, the Right Hon. the COUNTES OF DARTMOUTH, Mrs. RADCLYFFE, Miss G. PASLEY, Mrs. VALLANCE, Miss AGNES SHARP, &c., all well-known names at Shows, use these machines.

CUTTINGS FROM THE "FIELD."

I extract the following salient points from my letter which appeared in the above journal on January 17th, 1880:—

Mr. Alex. Comyns, jun., Ardenaine, Kingstown, Ireland, a well-known exhibitor of fancy poultry, writes as follows:—"January 10th, 1880.—I see that you are collecting evidences as to artificial rearing of chickens. It seems almost superfluous to require evidence on such a point, as it is well-known that artificial rearing has been successfully practised for some years past. During the past five seasons I have reared all my dark Brahma chicks artificially, using formerly one of Mrs. Cheshire's Mothers, and last year also one of your Hydro-Rearing-Mothers. I may add that last year all my chicks were hatched in a 90-egg Hydro-Incubator, and that this week I have several chicks out from eggs laid by pullets hatched in the Incubator last season, thus conclusively showing that the assertion that Incubator-hatched birds are unproductive is sheer nonsense."

I quote now from a letter dated Jan. 7th, 1880, from Mr. J. Burnett, Sherrall Park, Tamworth:—"I worked my Hydro-Incubator with wonderful success last season, but only bought it very late. I did not keep an exact record of quantity hatched and reared (above 400)."

Mrs. John Langton, Wandsworth, S.W., says:—"I hatched by the Hydro-Incubator chickens in May, June, and September last, and they were so fine that the bailiff was quite jealous, for they were nearly double as large as those he had brought up by the hens. At six weeks the bailiff wanted to let them roost in the trees." (Mrs. Langton was equally successful in hatching out and rearing ducks, moorhens, and Californian partridges or quails. She has purchased another Incubator, as she wishes to try turkeys and golden pheasants this year.)

Miss Agnes Sharp, Culverden Hill, Tunbridge Wells, wrote me a few days back:—"I weighed my largest turkey yesterday, Jan. 7th. He was hatched in the Hydro-Incubator the last week in May, and weighed 23½ lbs.; not bad, I flatter myself, for my first attempt at turkey raising, and speaks well for artificial rearing. The birds I have had killed were excellent eating." This lady has been most successful in hatching and rearing poultry, and is a well-known exhibitor of Houdans and Crèves.

Dr. H. Vines, M.D., Littlehampton, wrote me Dec. 4th, 1879:—"All the world here prophesied that my chicks would die. I knew better, and their wish was almost father to the thought. Incubators are at first hateful. Not one chick has died or sickened, and they are so strong that they will run about all over a large garden for hours together, with the thermometer almost at zero. Cats, I suppose, think them supernatural at this time of year, and do not attempt to molest them. They regard them, like the populace—with melancholy wonder." And on Jan. 12th he writes:—"I congratulate you on your great success. You have improved on nature. I have not lost one of the forty-one chickens hatched Nov. 5th, 1879."

In the *Standard*, Oct. 3rd, 1879, under the head of "Rearing of Poultry," appeared a long letter. I extract these points from it:—"1st: 430 chickens and ducks all put into Hydro-Rearing-Mothers; 2nd: Not a single chick reared under them has suffered from vermin or parasites, such as no bird reared under a hen can be free from; 3rd: My artificially-reared birds have grown far larger and stronger, and much more quickly, than the few I left to hens to bring up; 4th: Out of the 430 chicks and ducks I have lost thirty-two from various accidents, chiefly from so much wet weather."

Mr. J. R. Thairlwall, of Darlington, has kept fowls on his farm for three years, and is increasing the number as rapidly as he can, as he finds that nothing on his farm pays him so well as poultry. I sent him a set of Farmer Miles's caponing instruments.

and, after operating on over one hundred cockerels, he only lost two birds. He employed chicken manure for the turnips, and his crop was considered the finest in the district.

Mr. John Coleman, Esorick, York, having bought an Incubator and a Rearing-Mother just after the Kilburn Show, to test if poultry could be successfully hatched and reared artificially, wrote on Oct. 9th for a second Rearing Mother, adding that he was much pleased with the apparatus.

Miss Harvey, of Ardentinny, N.B., although living in Scotland, seeing the time was coming when there would be a demand for early sittings of ninety eggs (all laid within two days) for Incubators, is offering to send them to the South at most moderate rates.

Fresh eggs in the London shops are selling at 3d each. In Paris, owing to the hard weather and the demand for early poultry, they have been fetching 4d each.

Mrs. L. E. Wilson was most successful last year, hatching and rearing the prize-birds at her place near Southampton; but she very justly remarks that care is necessary in rearing, and plenty of air.

Mr. Bartlett told me not long since that tropical birds at the Zoological Gardens would, on a fine bright day in winter, come out, if the doors were opened, and enjoy the fresh air, although it was often very cold.

The Hon. Slingsby Bethell wrote to the *Field*, Oct. 4th, 1879, about the facility of hatching, and finishes his letter with:—"I consider the Artificial Mother most useful, if not overcrowded. Every person breeding chickens ought to possess one or two of these, whether they use hens or Incubators for hatching purposes."

Mr. Frank Willan, of Thornhill, Bitterne, who has used the Hydro-Rearing-Mother for two years, writes March 17th, 1879:—"I find it answers well. I had over fifty chickens and ducks under one last year, and brought them all up together. I have now thirty-eight under one, and forty under the other, all doing well."

The Rev. Joseph Heath, Wigtoft Vicarage, Spalding, Sept. 22nd, 1879, writes:—"I have now just one hundred and fifty chickens. About thirty were taken from hens when first hatched, and placed with those hatched by the Incubator under the Hydro-Rearing-Mother, where they do remarkably well. We only lost eight, which we killed ourselves, as they were weak and lame."

Mrs. Damant, of Bonchurch, Isle of Wight, was well-pleased with her Hydro-Rearing-Mother. Mrs. Kettlewell, of East Harptree; Mrs. Finlay, of Dulwich; Mr. Bradbury, of Gloucester, and many others, also use them; so that not only commercial poultry farmers, but pure fanciers, see an advantage in artificial rearing.

Now I will give the opinion of Mr. Everard Jones, Glenmoidart, Salen, Lock Sunart, N.B., who wrote me on Oct. 24th last:—"I cannot make out why Incubators are not more common than they are, as they are so much less trouble than having a lot of hens all sitting about and breaking their eggs. It is a most inestimable benefit to a person like myself, with the whole place overrun with rats. Last year we lost I don't know how many sittings with the rats breaking the eggs, and then, when they did hatch, the rats had most of the chickens. But this year, with the Hydro-Incubator and the Game-Rearer, we have not lost a single one. The Open-air Rearer is the best, as the glass is such a comfort. The chickens are able to get out before anyone is about in the morning, whatever the weather is like, and free from rats and other vermin."

Although I have endeavoured to show that eggs can be artificially hatched by Incubators in a house, without the necessity of the women going into the wet and cold in winter, to look after the "sitting hens;" and although I have brought to your notice many facts in this letter in regard to rearing, I by no means "make light" of the art of producing strong healthy birds brought up by hand, which has now been named "artificial rearing."

Those who adopt the "hand system" start with many points in their favour, viz., the entire absence of vermin—great diminution of disease—mortality from accidents by the hen (which it is unnecessary to name, for they are too well-known) and they have a tame bird to deal with.

If these chicks are cared for from the time they come from the Incubator-drawer, are kept in the "drying-box" for at least twenty-four hours, are then moved to the rearing-mother, and after being fed, are secured under the founce by the zinc slides, then cared for and fed regularly for a few days, and allowed plenty of air. They can after that have free access to the open-air, although it may be cold. The result is—fine healthy chicks with good constitutions.

The occupation, I am told by many ladies, is far more exciting than novel reading, and more remunerative; and further, it tends to regularity and early rising, for both the Incubator and chicks require attention.

It may not be generally known that the fowls and ducks that are purchased in the West of Ireland for 3s to 5s per dozen, are collected, killed, and after being packed in barrels and cases with block ice, come over to the English markets. Mr. Pigot hearing of

this, secured a supply of live Irish poultry for his farm in Surrey. Space prevents my going into detail; suffice it to say that he finds that this class of poultry will not fatten, and have no constitution. This is owing to the stock being poor and small, a result from in-breeding, and their being brought up on starvation principles.

LONDON, January 15th.

THOS. CHRISTY.

P.S.—The Roulliers' second reply has this morning reached me. They categorically state that during 1879 they hatched on their own premises 44,000 chickens, which they account for as follows: About 24,000 were sold and forwarded at an early age to all parts of France, to Belgium, Switzerland, and Germany, and of these they can of course give no further news; 10,000 more were distributed to the peasants around their immediate neighbourhood, and 10,000 were kept by themselves, and of these 10,000 they distinctly state that they have not lost more than between 12 per cent. and 15 per cent. All the chicks were hatched artificially, and the 10,000 they kept were also reared by Hot-Water-Mothers, and they add, during the six years they have farmed poultry on this system the different races have rather improved than gone off, both as regards size and vigour. They tell us it is simply English ignorance and obstinacy which keeps back artificial poultry rearing here, while in France it has long been an accepted and accomplished fact.

EMPLOYMENT OF INCUBATORS.

From *Field*, 4th Oct., 1879.

SIR,—Having made trial of Messrs. Christy & Co.'s Hydro-Incubator, and having found it very successful, I should be much obliged to you if you would open your columns to the public in order that we may hear different reports of the results obtained from this valuable apparatus. Having purchased mine late in the summer, I was unable to set it working before the 4th or 5th of August. My housekeeper took the management of it in the kitchen, and was thus able to keep it in operation with very little trouble. About 75 per cent. of chickens were hatched out alive, and with the exception of a few casualties since, partly owing to the inclemency of the weather, &c., they are all doing well. Many eggs proved infertile; in others the chickens were found fully developed but dead. This latter catastrophe may possibly have been due to an insufficient damping of the earth-tray beneath the egg-drawer. The eggs were turned twice a day, and once moved in the drawer. Two to two-and-a-half gallons of boiling water being added to the cistern every twelve hours.

I consider the artificial mother most useful, if not overcrowded. Every person breeding chickens or game should possess one or two of these, whether they use hens or Incubators for hatching purposes.

TANGIER PARK, BASINGSTOKE, October 1st.

SLINGSBY BETHELL.

THE REARING OF POULTRY.

From *The Standard* of September 30th and October 3rd, 1879.

TO THE EDITOR.

SIR,—I have read with much interest the correspondence and articles your paper has lately contained on agricultural matters; particularly as regards the rearing of poultry in England. My opinion has long been, and my experience with poultry confirms me in it, that if only farmers and cottagers at home would devote a little regular attention to this form of "stock," nothing would pay them better; and this could be achieved at a smaller outlay of capital for houses and appliances than they would require for any other class of farming. Why, with every agriculturist complaining of bad times, do we still go on year after year paying away to foreign countries immense sums for dead poultry and eggs? Even aided by these large foreign supplies, at present poultry and ducks are hardly obtainable in early spring. I have made a fair trial this year of raising poultry for table use—chiefly as a source of amusement—but having succeeded so well, I shall extend my operations, and try what advanced poultry farming—hatching in winter and early spring with Incubators, breeding good table birds, caponing, and fattening, will do for us in this country. A brief *résumé* of my work will, perhaps, prove of interest to your readers.

I commenced operations last February by purchasing a Hydro-Incubator, which I first tried with 17 "shop" eggs, producing me seven chicks. I next put in 85 eggs, principally from my own hens, and got 63 chicks. In April I bought another Hydro-Incubator, and got the two to work with 85 eggs in each, out of which number I obtained 132 chickens. In May I again put 85 eggs in each of my Hydro-Incubators, and produced 126 chicks; and in June I got 102 chickens and ducks from 140 eggs entrusted to the two machines to hatch out. The grand total of my hatching was therefore 430 chickens and ducks, all of which, after two days, passed in a basket before the kitchen

fire, were put under an artificial mother. One point about these latter appliances deserves most special attention. During all this season not a single chick reared under them has suffered from vermin or parasites, such as no bird reared under a hen can be kept free from. The effect of this cleanliness has been to cause my artificially-reared birds to grow far stronger and larger, and much more quickly, than the few I have left to hens to bring up. In my opinion the absence of parasites in these young chickens means a very perceptible increase of profit in thus raising them.

I have now got into a regular system of working my Hydro-Incubators, which I think partly accounts for my success with them. I fill up both the machines on the same day. After seven days I reject the non-germinated eggs, and replace them by fresh eggs, so that my hatching is really only completed on the twenty-eight or twenty-ninth day. Then for three days I work the Hydro-Incubators empty, allowing the drawer to remain open for thorough cleansing and purifying. I make, therefore, about one hatch per month for each machine.

I calculate my average hatching to be at the rate of fifty-five chicks out of every seventy fertile eggs, or at the rate of SEVENTY-EIGHT PER CENT. FOR THE ENTIRE SEASON. Out of FOUR HUNDRED AND THIRTY DUCKS AND CHICKENS I have lost THIRTY-TWO from various accidents, chiefly from so much wet weather, but all the survivors have been reared artificially.

This next season I purpose beginning to hatch in November, and shall go into it more thoroughly. I mean to have a fine stock of nicely fattened young chickens and ducks before our old friend the "hen" has made up her mind to begin sitting on her eggs.

I should like to say one word more upon another subject which has been mentioned from time to time in your columns, and this is the Prickly Comfrey. I use it frequently and regularly, both for my fowls and for a lot of Belgian Hares which I breed. The fondness of the latter for it is most extraordinary. They will always leave cabbage for Prickly Comfrey; but its value to me for their keep is, that however much they eat of it, and no matter how frequently I give it them, Prickly Comfrey never has the pernicious effect upon them that too much green food of any other kind produces. For the fowls I hang up a fresh-cut bunch for them to peck at, and much they enjoy it. Prickly Comfrey answers admirably with me, but of two purchases of it which I made, one has turned out worthless, and is, I suppose, the wrong sort.

E. J. BARNES.

Rose Cottage, High Street, Leytonstone, Essex.

Mr. Barnes has now moved to the London Tavern, Clifton Road, South Norwood.

EXTRACTS FROM "LIVE STOCK JOURNAL."

[Vol. XI., No. 314. April 9th, 1880. Page 294.]

SIR,—I enclose result with one of your Hydro-Incubators, which I think will please some of your readers:—

Put in	...	...	...	...	...	...	...	93
Hatched alive	...	...	...	...	...	...	...	64
Hatched alive, but killed by me in releasing from shell	...	...	...	...	...	...	...	7
Broke in turning	...	...	...	...	...	...	...	5
Eggs with dead chicks in, and unfertile eggs	...	...	...	...	...	...	...	17
Total	...	...	...	...	...	...	...	93

LEA PRIESTLEY EDWARDS.

SIR,—I have worked Christy's 90 Egg Machine for 30 days, from 1st to 30th March, with the following results:—80 Prize-Bred Houdan Eggs and 9 Ducks' Eggs were put in, of which there were:—

Clear	...	...	...	...	...	...	24
Dead in shell	...	...	...	...	...	...	24
Broken	...	...	...	...	...	...	2
Died before 30th day	...	...	...	...	...	...	7
Hatched	...	...	...	...	...	...	32
Total	...	...	...	...	...	...	89

Temperature in working room, 50° to 70°; heat in drawer, 100° to 106°; daily supply of water, 6 to 12 gallons.

The chicks dead in shell varied with different batches. The eggs were mostly bought from well-known dealers. One batch of 12 hatched 8 chicks, 4 were clear.

The 9 ducks' eggs, hatched 4, clear 5. From this I gather chicks dying in the shell must result from want of vitality in the egg, else why should 21 eggs, in the same drawer as 69 others, produce all live chicks, and the 69 have 24 dead in shell?

I find, after some experience with hens as well as Incubators, it is no use helping the chick out of the shell, for if it has not strength to break the shell, it has not strength to live. I have often slightly helped to break the shell without injuring the inside lining, but I generally found the chick was weakly, and died in a few days.

BEDALE, YORKSHIRE, April 2nd.

HOUDAN.

SIR,—Having just had a hatch of chickens from one of the Hydro-Incubators, I think the particulars may, perhaps, be interesting to those who are watching the progress of artificial incubation. This being the first hatch I have had, I think you will agree with me that it is a very fair one.

Eggs put in	...	...	...	...	...	...	94
Hatched out	...	...	...	...	...	...	70
Unfertile	...	...	...	...	...	...	8
Broken by accident	...	...	...	...	...	...	2
Full grown chicks, but not hatched out	...	...	...	...	...	...	14
Total	...	...	...	...	...	...	94

At the time the chicks were being taken out, the heat of egg-drawer was allowed to get very low, and I think this will account for the fourteen not hatching out. I may also say that the chicks which were put under a rearing mother are now a fortnight old, healthy and well. I find the drying box very useful.

J. W. M.

INCUBATOR EXPERIENCE.

[Vol. XI., No. 313. April 2nd. Page 274.]

To the Editor of the *Live Stock Journal*.

SIR,—I have been much interested a few weeks ago in reading a correspondence as to the success of hatching and rearing chickens artificially. I purchased one of Christy's Hydro-Incubators and Rearing Mothers that I might try the experiment myself, and I give you the result of my first attempt, with which I am much pleased, especially as I had nothing to guide me in the management beyond the pamphlet. I placed 90 eggs in the incubator on the 14th of February, after working it two days to regulate the heat. On testing the eggs a week later I found 7 unfertile, and out of the remaining 83 eggs I had 65 living chickens and 19 dead in the shell. I put them in the artificial mother on my lawn the following day, and they are now over a fortnight old, and doing well. I have, besides these, 31 chickens under hens, but I much prefer the artificial mother, and have just bought a second to prevent overcrowding.

CLOSEWOOD, PURBROOK, March 23rd.

GEORGE COLLINS.

HATCHING RECORD.

[Vol. XI., No. 307. February 20th, 1880. Page 152.]

Placed in Christy's Hydro-Incubator on January 3rd, 45 eggs. January 24th, 6 chicks hatched; January 25th, 7 chicks hatched; January 26th, 10 chicks hatched; January 27th, 6 chicks hatched. Four chicks dead in shell, 12 infertile eggs—total, 45 eggs. Placed under hen on December 16th, 10 Leghorn eggs; hatched on January 6th, 7 chicks, 3 unfertile eggs. All the eggs were from prize brown-and-white Leghorns.

11, GREAT TOWER STREET, E.C.

JOHN C. FRASER.

[Vol. XI., No. 303. January 23rd, 1880. Page 69.]

The following are the results up to January 21st, 1880, obtained from Christy's Hydro-Incubator, the same which won the £25 at the Hemel Hempstead Tournament, 1878:—

Coloured Dorkings, eggs 4, unfertile 0, hatched 1, dead in shell 3. These eggs were 4 or 5 days old when placed in the Incubator. Rose-combed Dominiques, eggs 14, unfertile 0, hatched 12, chipped 2, dead since hatching 1. These eggs were all placed quite fresh in the Hydro-Incubator as they were laid. The chickens hatched, with the exception of the one Dominique, are all strong and healthy and doing remarkably well.

HERBERT R. PEEL.

CHRISTY'S REGISTERED POULTRY APPLIANCES.

HYDRO-INCUBATORS.

	£	s.	d.	Packing. £ s. d.
A 90-Egg Hydro-Incubator (GOLD MEDAL and £25 PRIZE.) worked by changing water each 12 hours	4	10	0	0 6 0
<i>Ditto</i> fitted with circulating boiler, obviating all change of water	6	0	0	0 7 6
The "Cottager Hydro-Incubator" for 90 Eggs, worked by changing the water	3	0	0	0 6 0
<i>Ditto</i> fitted with circulating boiler	4	10	0	0 7 6
"The Henwife's Hydro-Incubator, for 3 dozen Eggs (hot water) ..	1	10	0	0 2 0
<i>Ditto</i> (with circulating boiler)	2	12	6	0 3 0
250-Egg Hydro-Incubator, fitted with 1 large cistern and 2 drawers, each with rising and falling floor, worked by a thumbscrew ..	10	10	0	0 15 0

INCUBATOR FITTINGS.

Stands for "Fancier" and 90-Egg Incubators each	0	8	6	—
Drawer Supports for ditto do.	0	5	0	—
Thermometers (2 required) d.	0	3	0	0 0 6
Tell-Tale Egg-Testers (5 sizes) Hens 1/-, Pheasants 1/6, Ducks 1/6, Goose 2/-, Ostrich 5/-	—			0 0 6
Circulating Boiler for 90-Egg Incubators (for fitting to old-system Incubators)	1	10	0	0 1 6
Oil Lamp and Stove to work same	0	15	0	0 1 6
Gas Stove to work same	0	7	6	0 1 0
<i>N.B.—Circulating Boilers (if so specially ordered) can be arranged to work on the kitchen-range, or in any grate.</i>				
Stands for 250-Egg size each	1	0	0	—
Drawer Supports for ditto do.	0	7	6	—

HYDRO-REARING MOTHERS.

Improved Drying Box for newly-hatched chicks (padded & with tap)	0	18	0	—
Hydro-Rearing Mother (hot water) for 75 chicks, fitted with 3 sliding ventilating zinc doors (without park), for use under cover ..	2	4	0	0 4 0
<i>Ditto ditto</i> fitted with a circulating boiler, lamp, & screen ..	3	15	0	0 6 0
Open-air Rearer, consisting of a Hydro-Rearing Mother, with an enlarged Park, and glass frames to ensure a dry run. May be used in a field or a shrubbery. SUITABLE FOR POULTRY, PHEASANTS, &c. (worked by hot water)	3	12	0	0 5 6
<i>Ditto ditto</i> fitted with a circulating boiler, lamp, & screen ..	5	3	0	0 6 6
The "Cottager" Rearer (hot water, for use under cover only), for 50 chickens or ducks, without run	1	0	0	—
<i>Ditto</i> (hot water) and glass-covered Run, in which to feed chicks, for use out of doors	2	2	0	—
DRY MOTHER, for summer use and for rearing from three weeks old in winter (very useful as a coop also)	2	10	0	—
Large separate glass-covered Runs, tops and ends removable, wooden sides and bottoms, and 2 sliding doors	2	10	0	0 3 0
Small Open-air Rearer, for use with The Henwife's Incubator ..	2	2	0	0 4 0

SUNDRIES.

Egg Boxes, with divisions for each egg (in 3 sizes)—for 1 doz. eggs, 6d for 2 doz. eggs, 8d; for 6 doz. eggs, 1/-				
"Travelling Box" for sending small chickens, 16/- per doz.; each	0	1	6	—
"Carrying Box," for 50 small chickens, with park (<i>this makes an excellent small Dry Mother for chicks a week or two old, if they are at all crowded</i>)	0	17	0	0 1 6
Zinc Feeding Troughs for young chickens, per dozen .. 6/ and	0	8	0	0 1 0
Syphon Drinking-fountains for small chickens, in 2 sizes:— For young chicks 2/6, for adult birds 3/-				
Large four-legged Funnel for hot-water worked Incubators and Rearers each	0	4	6	0 1 0

N.B.—The words "HYDRO-INCUBATOR" are our Registered Trade Mark.

Thos. Christy & Co., 155, Fenchurch Street, London, E.C.

CHRISTY'S REGISTERED POULTRY APPLIANCES.

Advantages of Purchasing Appliances as arranged in "Sets."

- 1.—They come cheaper.
- 2.—IF PREPAID the prices will include the cost of Carriage to any Station in England. If NOT PREPAID the Sets will only be delivered at the City Receiving Offices.
- 3.—Only the best class goods are made up into "sets."

N.B.—The words "HYDRO-INCUBATOR" are our Registered Trade Mark.

REDUCED PRICES OF APPLIANCES ARRANGED IN "SETS."

	£	s.	d.
Set No. 1 , consisting of a 90-egg Hydro-Incubator (Gold Medal Pattern) worked by hot water, on stand, with pull-out Thermometer, drawer support, Hydro-Rearing Mother, worked by hot water, without Park, 1 High-range Thermometer, Tell-tale Egg-tester, Pedestal and Zinc Troughs...	8	0	0
Set No. 2 , the same as Set No. 1, but with Hydro-Incubator fitted with a circulating boiler, and Hydro-Rearer with a circulating boiler, oil stove, and screen	11	0	0
(Gas Stove for Incubator 7/6, Oil Stove 15/-, extra.)			
Set No. 3 , consisting of a 90-egg Hydro-Incubator (Gold Medal Pattern) on stand, with drawer support, a Drying Box, OPEN-AIR REARER (new pattern) an Egg-Tester, Pedestal, Zinc Feeding Troughs, and 2 Thermometers...	10	0	0
Set No. 4 , the same as Set No. 3, but with HYDRO-INCUBATOR fitted with a circulating boiler, and the OPEN-AIR REARER with a circulating boiler, oil stove and screen	18	0	0
(Gas Stove for Incubator 7/6, Oil Stove 15/-, extra.)			
Set No. 5 , a "Fancier" Hydro-Incubator (worked by hot water) on stand, with drawer support a Drying Box, an OPEN-AIR REARER, a Cottager Rearer with small run, one Egg-Tester, 3 Thermometers, Feeding Troughs, &c., &c.	13	0	0
Set No. 6 , same as Set No. 5, but with the "FANCIER," fitted with a circulating boiler, and OPEN-AIR REARER and Cottager Rearer, each with a circulating boiler and oil stove	17	10	0
(Gas Stove for Incubator 7/6, Oil Stove 15/-, extra.)			
Set No. 7 , consisting of a 250-egg Hydro-Incubator on stand, with a drawer support, Thermometers, four-legged Funnel, and 2 Drying Boxes, 2 OPEN-AIR REARERS, Hydro-Rearing Mother, with the necessary Feeding Troughs, &c.	22	15	0

FATTENING APPLIANCES.

Case of Caponing Instruments, with full instructions	2	2	0
A fattening pen for poultry, &c., with separate compartments for 6 fowls	3	0	0
Ditto ditto for 12 fowls	5	5	0
Ditto ditto for 24 fowls	10	0	0
A Cheap Fattening Coop for 6 to 8 birds, in 2 compartments	2	0	0
Cramming Machine, for cramming poultry with dry food	7	15	0

No allowance can be made for returned Crates, and all Thermometers are sent at Purchasers risk.

CHEQUES to THOS. CHRISTY & Co., crossed GLYN, MILLS & Co.

Full description as to Railway and Station should accompany each Order.

Thos. Christy & Co., 155, Fenchurch Street, London, E.C.

OSTRICH HYDRO-INCUBATORS.



	<i>£ s. d.</i>			<i>Packing. £ s. d.</i>		
No. 1 Incubator, with 2 drawers, each 21 in. X 21 in. X 8½ in. deep	10	10	0	1	0	0
No. 2 do. with 2 drawers, each 34 in. X 21 in. X 9 in. do.	13	0	0	1	2	6
Set of Thermometers for either of above—2 low-range, 1 high-range	0	9	0	—
No. 3 with 3 egg-drawers, each 12 ins. X 27 ins. square, divided into twelve egg-spaces and running on wheels as shewn in above drawing	13	0	0	1 2 6
Set of Thermometers for above	0	12	6	—
Stands—For No. 1	1	0	0	—
Nos. 2 and 3	1	2	6	—
Supports for egg drawer	each	0	10	0
Egg Testers for Ostrich eggs	each	0	5	0
Ostrich Hydro Rearing Mothers, with hot water tank	16	0	0	2 10 0
Ostrich Hydro Rearing Mothers—cold mothers, without tanks	13	0	0	1 10 0
Ostrich Food Mining Machines, ¼th and ½th out, 3 knives each	5	5	0	—
Spare knives	0	9	0
Circulating Boilers to any of the above Incubators	...(extra)	1	10	0	0	2 0
Rippingille's Patent Lamps and Stoves for use with the outside boiler attachment	15s and	2	5	0 0 4 0

A rising and falling floor, worked by simply turning a screw, can be fitted, if desired, at from 12s to 20s per drawer extra. With this added, the same Incubator can as well be used for hens' eggs as for ostrich eggs.

Orders should be sent home through the English Merchants.

If stated at time of order, an outside boiler attachment can be fitted to either of the three Standard Sizes, doing away with the refilling every 12 hours, and costing 30s. to 50s. Oil Stoves (if required) extra. This attachment does not increase the measurement for shipment much.

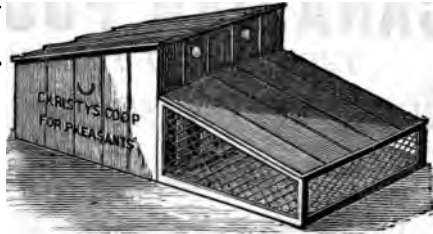
N.B.—the words "HYDRO-INCUBATOR" constitute our Registered Trade Mark, and must not be infringed upon.

THOS. CHRISTY & Co.,
Offices and Show Rooms: 155, Fenchurch Street, London.

HEN COOPS of a very simple but efficient pattern, specially adapted for rearing broods of Pheasants.

Price 20/-

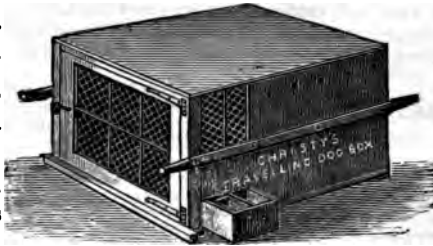
Or if without the Wired-in Run
14/- each.



TRAVELLING DOG BOX

made in 3 sizes. Prices, including lock and key, drawers and troughs, 27/6, 36/- & 50/-

Recommended by "Wildfowler" in the *Field* :—"Eminently adapted for its object—the requirements of dogs in transit."

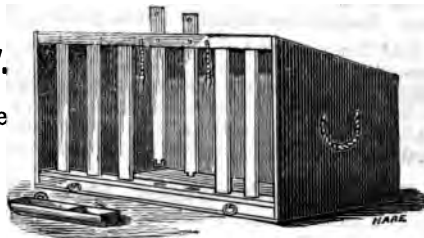


CHRISTY'S

SHIPPING COOPS FOR POULTRY.

Up to 6 birds, with bird-cage bottom and shifting bars,

12/6 each.



THOS. CHRISTY & CO., 155, Fenchurch Street, London.

**PIMENTO, OR SWEET PEPPER
FOR POULTRY.**

Just imported into England. It is without heat, and most valuable for bringing birds on to lay and to stimulate them during the winter. Especially recommended to Canary Breeders for colouring the feathers of the birds.

6d. per Ounce.

THOS. CHRISTY & Co., 155, Fenchurch Street, London.

CHAMBERLIN'S CANADIAN POULTRY MEAL.

THE CHEAPEST FOOD IN THE WORLD FOR
TURKEYS, GEESE, DUCKS, AND CHICKENS.

Received the **ONLY AWARD** given by the International Jury,
Paris Exhibition, for Poultry Food.

Turkeys, Geese, Ducks and Chickens fed on this Meal thrive wonderfully, are kept free from disease, and will lay nearly double the number of eggs. Fowls commence laying at about seven months old. Turkeys, so difficult to breed, are reared with the greatest success upon this Meal, with scarcely a loss of 3 per cent. If shut up, they will fatten in a very short time, and the colour and delicacy of the meat is surprising. It is invaluable in cold and exposed situations, and success at Poultry Shows is also assured by the use of this Meal.

November 5th.

SIR,—I had wonderful luck with my Turkeys this year, having reared over 400 Turkeys and Fowls, which I consider due in a great measure to their being fed on your Canadian Meal and Compound.

I am, yours respectfully,

CHARLES HALL.

HILL FARM, BANBURY, OXON, May 11th, 1881.

SIR,—The Canadian Meal I had from you last year answered so well, that I shall be glad if you will send me the enclosed order as soon as you can. I reared 31 Turkeys from 60 eggs; my success I consider due to your Meal and Aromatic Compound, the season being so cold and wet; none of our neighbours reared half the quantity. The P.O.O. I enclose is for double the quantity I had last year.

I remain, yours respectfully,

ANN ADKINS.

Price 24s per cwt., including 12 Packets of Aromatic Compound and Bag, less 4s per cwt. to meet the charge for carriage; net price to remit with order, 20s per cwt. Packed also in Three Pound packets, 6d each.

Sole Manufacturer of the celebrated Aromatic **SPANISH MEAL FOR PHEASANTS** (awarded *Hon. Mention, Paris Exhibition*), **CAYCAR EXCELSIOR FOR PHEASANTS**, **AROMATIC COMPOUND FOR ROUP, GAPES, SNARLES, &c., IN POULTRY** (*Hon. Mention, Paris Exhibition*), **D.S. MEAT GREAVES FOR PHEASANTS AND PARTRIDGES**; **GRANULATED DOG FOOD**, in Packets, 2d each. **MEDICATED DOG SOAP**, 6d per Tablet. Write for the new Treatise on Pheasant Rearing.

“Chamberlin's Guide to Poultry Rearing.” Price 6d.

CHAMBERLIN'S GRANULATED DOG FOOD.

The Granulated Dog Food is found invaluable for Pointers, Setters, Mastiffs, Hounds, House and Yard Dogs. It keeps the Dogs in perfect health, and their coats free from all unpleasant smells. It is more nourishing than oatmeal, and very grateful to the palate. Dogs eat it with avidity. The Granulated Dog Food is invaluable for bitches just whelped, and also for young puppies, which feed wonderfully upon it. It is constantly supplied to eminent breeders and judges of dogs.

Price 2d per Packet.—Packed in Boxes, 3 doz. Packets (including Box) 6s 6d; 12 doz. Packets (including Box), 25s.

CHAMBERLIN'S MEAT BISCUITS

Supersede all yet introduced. Used in the Royal and Principal Kennels

Price 18s per cwt., Bag included. Special Quotations for 5 cwt. and 1 Ton Lots

JAMES CHAMBERLIN

GAME, POULTRY, AND DOG FOOD WAREHOUSE,
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THE "CEREAL" POULTRY MEAL.

HAVING for several years studied the management of Breeding, Rearing and Feeding of Poultry, and in various ways experimented in blending Meals for the requirements of Poultry Farmers, Fanciers and Gamekeepers, I have resolved to offer the above, and can confidently recommend it as a cheap and valuable Food for all kinds of Poultry.

Great success has been achieved by all who have used it for rearing and can be used as soon as chicks are hatched with great benefit.

Fowls may be kept in perfect health and condition in close confinement, and it is highly approved for its Egg-producing qualities.

It is much appreciated by Fanciers preparing birds for exhibition, as it possesses stimulating and invigorating properties.

Sold in Bags at 11/6 per Cwt.

(On Rail at Tonbridge Station, S.E. Railway.)

Quantities of 5 cwt. and upward delivered free to any station on the South Eastern Railway.

TERMS CASH.

Samples and Testimonials on application. A trial is earnestly solicited

**THOMAS LAMBERT,
POULTRY MEAL MANUFACTURER,
HADLOW, TONBRIDGE, KENT.**

MARKET FOR SURPLUS LIVE POULTRY.

The AUCTION SALES (held monthly during the summer, and fortnightly in the autumn and winter) at

CAVE'S, MOSELEY STREET, BIRMINGHAM,

are the best medium for the sale of all classes of Surplus Live Poultry. The Sales are well attended by Dealers and Amateurs. The auctioneer acts strictly as Agent only between Seller and Buyer, and CASH is remitted to each owner the day after the Sale. The Sales are well Advertised in the Local Papers, as well as every Friday in the "*Live Stock Journal*." Poultry will be put into proper Sale Hampers on arrival. The Railway Companies deliver all Poultry to the Sale Yard. Entry Fee for Poultry 1s. per pen; Commission on the Sale, 5 per cent; which charges are deducted from proceeds. For further particulars and Labels, address CAVE'S, MOSELEY STREET, BIRMINGHAM—(The old Beardsworth's Yard, where upwards of 100 Horses are sold by auction every Thursday in the year.) The Poultry Sales are held on Tuesdays.

CHRISTY & CO.'S PUBLICATIONS.

NEW COMMERCIAL PLANTS.—No. I.—Liberian Giant Coffee, the African Rubbers, Turkish Tobacco, &c. By T. CHRISTY, F.L.S. Price 1s.

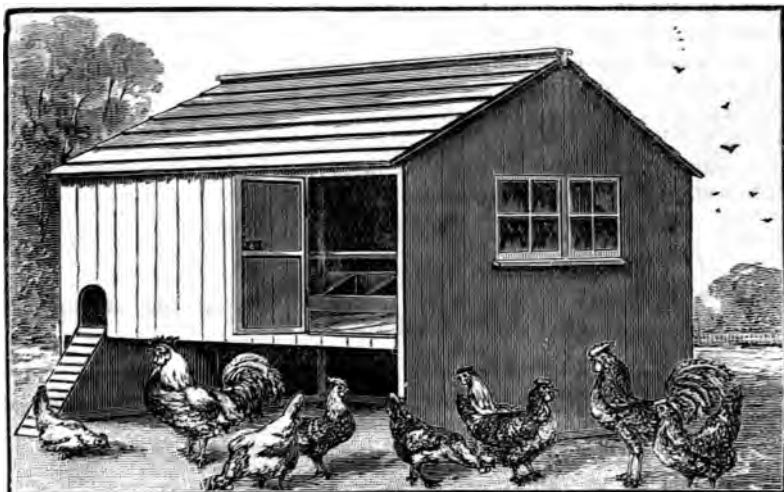
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BOULTON & PAUL, MANUFACTURERS, NORWICH.

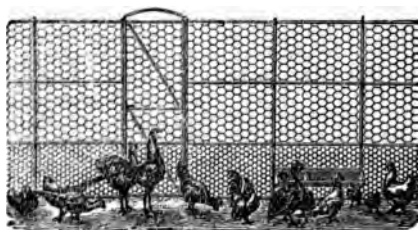
NEW PORTABLE FOWL HOUSE. Price £12.



Size, 8 ft. long ; 6 ft. wide ; 6 ft. high at Eaves ; 7 ft. 6 in. high at Ridge. To accommodate 50 Fowls. Fitted with Perches, Nest Boxes, &c. A Flap is provided at the back for the removal of Eggs. Takes to pieces for Packing, and is easily put together. It is well made, and only best materials are used. Painted three coats, and lime-whited inside.

Price complete, £12, Carriage Paid.

ORIGINAL MANUFACTURERS OF THE IMPROVED POULTRY FENCING.



Made in hurdles, 6 ft. long, 6 ft. high, with anchor-formed feet, covered with stout galvanised wire netting. This fence is a much stronger description of fencing than the lattice panels, and is more portable; being made in the form of hurdles, is easily fixed or removed. It can be made to suit any situation without extra charge, but is only stocked in 6 ft. lengths. The gate can be placed in any part of the fence.

Great Reduction in Prices: per yrd
6 ft. high, including all necessary Bolts & Nuts, 4/6
Doorway complete, 2 ft. wide, including
Standards and Arched Stay ... 10/6 each
Angle-Iron Pillars for Corners, with
Cast Ornaments... 2/- each

NOTE.—Carriage Paid on orders of 40s. value. Orders executed on receipt.

From SAMUEL ROGERS, Esq., Widoombe, Bath.

March 17th, 1881.

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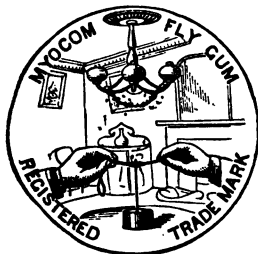
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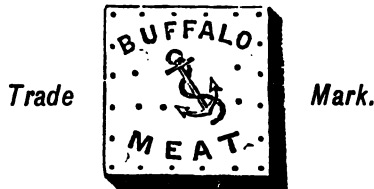
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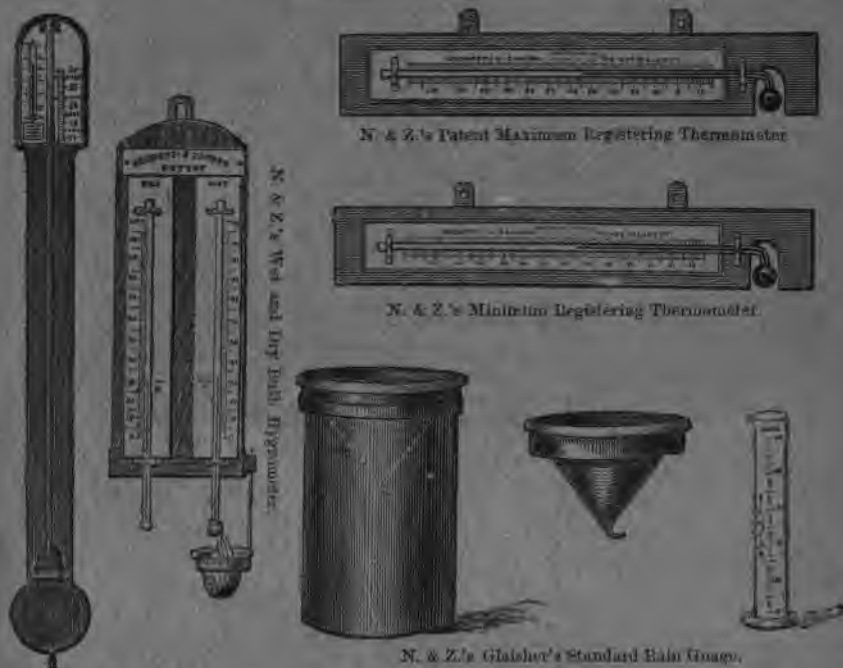
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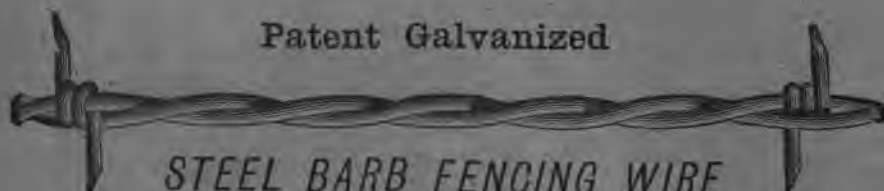
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